



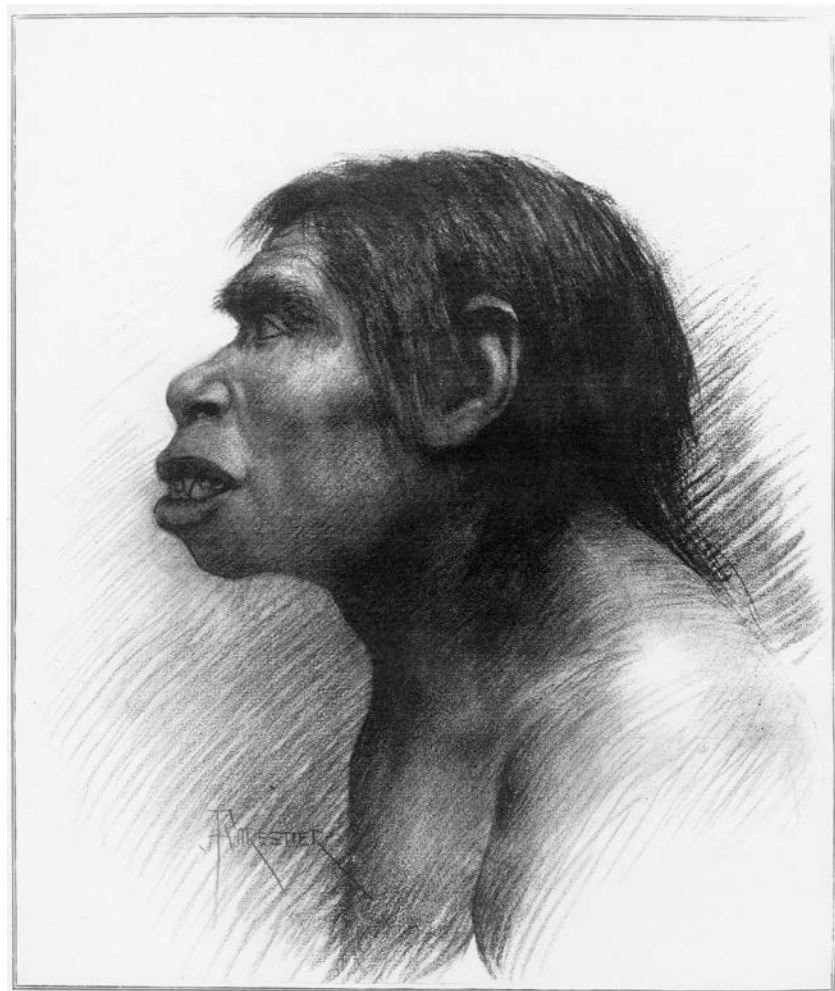
**British
Geological Survey**

NATURAL ENVIRONMENT RESEARCH COUNCIL

An annotated select bibliography of the Piltdown forgery

Informatics Programme

Open Report OR/13/047



BRITISH GEOLOGICAL SURVEY

INFORMATICS PROGRAMME

OPEN REPORT OR/13/47

An annotated select bibliography of the Piltdown forgery

Compiled by David G. Bate

Keywords

Bibliography; Piltdown Man;
Eoanthropus dawsoni; Sussex.

Map

Sheet 319, 1:50 000 scale, Lewes

Front cover

Hypothetical construction of
the head of Piltdown Man,
Illustrated London News,
28 December 1912.

Bibliographical reference

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Foreword

This bibliography was begun some 43 years ago. It grew out of personal curiosity and was added to from time to time according to the compiler's inclination. The work was brought to its present more comprehensive state at the behest of Andrew L. Morrison, archivist at the British Geological Survey, who conceived the idea of creating a web-based exhibition to mark the centenary of the first formal announcement of the Piltdown 'discovery' in December 1912. The bibliography complements the exhibition by providing, in its commentary, the information that was used to inform the 'Piltdown Timeline.' The exhibition itself was a joint venture between archivists at the British Geological Survey—which provided all the text and some images—the Natural History Museum, and the Geological Society of London.

The Geological Survey played a small part in prompting the eventual exposure of the forgery by determining the true age of the Piltdown gravel; and it contributed to the subsequent scientific investigation that revealed the full extent of the forgery.

May 2014

Acknowledgements

Were it not for repeated promptings and judicious bullying from BGS archivist, Andrew L. Morrison, this bibliography might never have achieved its present, more or less acceptable state. He is also thanked for bringing a number of useful items and pieces of information to my notice. John Farrant (Vice President, Sussex Archaeological Society) is particularly thanked for giving me privileged access to his recently published biography of Charles Dawson, a key player in the Piltdown affair. He also kindly supplied me with his detailed list of Dawson's published works, along with other appendices that are still in the final stages of preparation at the time of writing (described herein under Farrant 2013). Professor J. Francis Thackeray (Director, Institute for Human Evolution, University of the Witwatersrand) is thanked for kindly supplying me with copies of his papers and for helpful discussion.

The library staff at the British Geological Survey, Keyworth, and Sussex Archaeological Society, Lewes, are also thanked for their assistance.

It is only fair also to record here the contribution of John Stevenson, ably assisted by Jacqueline Hannaford and Emma Ball, who all worked hard to construct the web-based Piltdown Timeline.



Discussion on the Piltdown Skull — a painting by John Cooke, exhibited in the Royal Academy, 1915. The picture was presented to the Geological Society in 1932, by Dr C. T. Trechmann, F.G.S., and now hangs at the Society's premises in Burlington House, Piccadilly. *Back row, left to right:* Mr. F. O. Barlow, Prof. G. Elliot Smith, Mr. C. Dawson, and Dr. Arthur Smith Woodward; *front row:* Dr. A. S. Underwood, Prof. Arthur Keith, Mr. W. P. Pycraft, and Sir Ray Lankester. (Reproduced courtesy of the Geological Society of London).

Adapted extract from **The Sussex Skull** by H. R. H.
From the *Hastings and St. Leonards Observer*, 15 February 1913

Two hundred thousand years or so —
I don't quite know how long ago
This lady lived in the Sussex Weald
Whose skull's just lately been revealed.
Amidst gravelly flints she long had lain
Before she came to light again,
And little did she ever think
That she'd be called the "missing link."
The fair sex, in those days of yore,
Had little chin, but lots of jaw.
But this was chiefly used to crunch
The roots and nuts they munched for lunch...
This damsel's wits were somewhat dull —
Note the great thickness of her skull,
Its shape resembled — as you see —
In most respects a chimpanzee.

But of one thing we may be sure
That she was once the Cynosure
Of eager swains, whose deep-drawn sighs
Evoked compassion from her eyes.
And doubtless she would much delight
When, for her favour, they would fight,
Dealing each other mighty whacks
And smashing blows with stony axe.
The vanquished she aside would shove,
And to the victor give her love.
Just as, in modern times, we find
Rude strength appeals to female mind...

Note: The Piltdown skull was considered
By A.S. Woodward to be that of a woman

1 Introduction

‘Ever since the Piltdown man was shown to be a hoax about half a century ago, science has been haunted by the spectre of fraud. By and large, most researchers have felt themselves part of an honourable tradition of being seekers after scientific objectivity. And examples of trickery and deceit have been few and far between. However, recent studies have shaken this view and challenged it as at best complacent, at worst misleading. The major scientific crimes of fabrication, falsification and plagiarism may be only the tip of the iceberg and there is evidence of a much wider and deeper problem, not of outright fabrication of results but of distortion, omission and exaggeration.’ So wrote Stephanie de Bono in an article for the *Telegraph* published in 2005. This criticism was aimed primarily at the biomedical profession, but her warning could have been applied with varying degrees of justification to almost any scientific discipline.

Furthermore, the often-made claim that scientific research proceeds in a rational way has been shown to be a myth. Thus, ‘Expectancy leads to self-deception, and self-deception leads to the propensity to be deceived by others. The great scientific hoaxes, such as the Beringer case and the Piltdown man...demonstrate the extremes of gullibility to which some scientists may be led by their desire to believe’ (Broad & Wade 1982; for Beringer see Jahn & Woolf 1963).

Perhaps then, there are still lessons to be learned from Piltdown. Yet the lessons are not confined only to a proper understanding of the circumstances of the forgery and its ability to remain undetected for forty years! Since 1953, when the fraud was first exposed, we have seen the development of an entertaining but unworthy ‘whodunit’ industry, in which almost anyone with a link to Piltdown has been considered a suspect. The evidence put forward in these cases is often circumstantial and sometimes flimsy in the extreme. The arguments frequently demonstrate poor judgement, personal bias and a tendency toward tunnel vision on the part of investigators. Little wonder that some commentators have expressed exasperation at the whole messy business (e.g. Bowler 1987, Chippindale 1990).

The list of suspects implicated in the Piltdown forgery has been said to number twenty-seven (Henderson 2003), although to the compiler’s knowledge no comprehensive list has yet been published. Turrittin (2006) examines sixteen of those directly accused. The following names, here given in alphabetical order, have been tainted by accusation, in some cases supported by detailed arguments, in others noted in passing, and in a few instances put forward presumably in jest (in the last category may probably be included two ‘confessions’). These are: W. J. Lewis Abbott, Frank O. Barlow, W. R. Butterfield, C. P. Chatwin, Chipper the goose, Horace de Vere Cole, Charles Dawson, Arthur Conan Doyle, W. L. H. Duckworth, F. A. Hampton, Venus Hargreaves, John T. Hewitt, Martin A. C. Hinton, Arthur Keith, A. S. Kennard, Robert Kenward (and the young Kenwards), John Lewis, R. A. Marriott, Harry Morris, Félix Pelletier, Grafton Elliot Smith, W. J. Sollas, Pierre Teilhard de Chardin, Samuel Woodhead and Arthur Smith Woodward. Entries under each of these names will be found in the bibliography.

It is the view of this compiler that the Piltdown forgery owed its early success to the grandiose ambitions of four rather self-important men, each in search of fame and academic recognition, but only one of whom was the actual forger. All, however, feature among the list of the accused.

The present bibliography, selective as it is, contains some 1190 citations—a remarkable testimony to the legacy of Piltdown, a legacy moreover that shows no sign of diminution. Herein will be found a cabinet of curiosities, from the sensible to the absurd, from ethical science to creationism, from wine to weird fiction.

2 Bibliography

Notes

It has not always been possible to consult original items, and in such cases secondary sources have been utilised. Where appropriate these secondary sources are cited following the annotated entry, or else the item may be qualified as ‘Not seen’. It should be noted that the system of bibliographic citation employed here does not conform to the BGS standard, but is one that will be recognisable to the user.

Attention is drawn to the very thorough bibliography and commentary on the Piltdown Man forgery by Tom Turrittin (2006), which covers the period 1953–2005. For literature published in the period 1912–1935 see Quenstedt 1936, where some additional European foreign language references may be found that are omitted from the present *Select Bibliography*.

The British Museum (Natural History), at South Kensington, was renamed the Natural History Museum in 1992 and in the commentaries that follow is mostly referred to by the latter name, sometimes shortened to NHM.

It should be understood that annotations are partly a summary of relevant material from the cited reference and partly added commentary by the compiler of this bibliography, together with cross references where appropriate.

A useful general source of information is Richard Harter’s Piltdown Man website. Harter himself died in 2012, but the site is currently still active. Harter’s website also provides access to the Clark University Piltdown Plot Project, a valuable archive of published information from newspapers and other printed sources, created by Charles Blinderman, author of *The Piltdown Inquest* (1986). The material that constitutes this archive was digitised using optical character recognition (OCR) and thus contains errors of transcription, but a good number of items cited in the present bibliography will be found therein: http://richardhartersworld.com/cr_i_a/piltdown/piltdown.html



The red dot (above) and black cross (left) beside the River Ouse, indicate the location of Barkham Manor, Piltdown, East Sussex.

(Map, left, by John Bartholomew, from *Times Atlas*, 1955. © Collins Bartholomew)

Anon. 1904. Report for 1903: [Sussex Archaeological Society, notice to quit Castle Lodge, Lewes.] *Sussex Archaeological Collections*, **47**, xiv–xv. ('The Council, in the Autumn, received an intimation that the Castle Lodge, which had been occupied by the Society since the year 1885, had been sold to Mr. Dawson, and a notice to quit at Midsummer, 1904, was soon afterwards served by him on the Secretary. This purchase by one of our own Members, and its consequences, took the Council completely by surprise—as it understood that if the property was to be sold the Society should have the option of acquiring it...' This somewhat underhand action on the part of Charles Dawson has been cited as one among a catalogue of deceptions and questionable dealings which cast his character in a poor light. On the other hand, Francis Vere 1955, p.110, claims from anecdotal evidence that Dawson assisted the Society in securing its present and greatly improved accommodation at Barbican House close by the Lodge. An update of the situation appeared the following year [not seen] in the Report for 1904, *ibid*, **48**, xv–xvi.)

Anon. 1912a. Pre-boulder clay man: discovery near Ipswich. *The Times*, 1 Feb 1912, 6. (For the background to this discovery see comments under Moir 1912b. The correspondent of *The Times* reported that 'the Ipswich skeleton thus discovered represents not only the earliest remains of man yet found in England, but, with the exception of the Heidelberg jaw, the earliest yet found in Europe, for the chalky boulder clay far antedates the period of Neanderthal man whose remains have lately been found so abundantly in France. ...the Ipswich remains belong to a much older race than that of Galley Hill...[but] like the Galley Hill man, the Ipswich individual is of the modern type. Although both are older in date than the Neanderthal race found in Belgium and France, yet neither of them shows the peculiar and somewhat simian features of that race.' The anonymous author of this well-informed article may well have been Arthur Keith, since the piece reflects his views. Two weeks after the appearance of this report, Charles Dawson wrote to Arthur Smith Woodward at the Natural History Museum to inform him of *his* discovery of a 'skull which will rival *H. Heidelbergensis*...' Before the year was out, Ipswich man would be robbed of his glory by the arrival of Dawson's Piltdown woman.)

Anon. 1912b. The earliest known Englishman. *Illustrated London News*, **140** (23 Mar), 442, 446–447. (An account of Reid Moir's discovery of the Ipswich skeleton, described by him in Feb 1912: Moir 1912b. Includes an impressionistic reconstruction of Ipswich Man by the artist Amédée Forestier.)

Anon. 1912c. The earliest man? / Remarkable discovery in Sussex / A skull "millions of years" old. *Manchester Guardian*, 21 Nov. (In spite of Smith Woodward's attempt at secrecy, the *Manchester Guardian* became the first national newspaper to announce the discovery of an early human at Piltdown. The anonymous reporter felt sufficiently confident to assert that 'There seems to be no doubt whatever of its genuineness, and more than a possibility of its being the oldest remnant of a human frame yet discovered on this planet.')

Anon. 1912d. Notes. *Nature*, **90** (5 Dec), 390. ('Remains of a human skull and mandible, considered to belong to the early Pleistocene period, have been discovered by Mr. Charles Dawson in a gravel-deposit in the basin of the river Ouse, north of Lewes, Sussex. Much interest has been aroused in the specimen owing to the exactitude with which its geological age is said to have been fixed, and it will form the subject of a paper by Mr. Dawson and Dr. Smith Woodward to be read before the Geological Society on December 18.')

Anon. 1912e. Palaeolithic man. *Nature*, **90** (19 Dec), 438. (A well informed summary of the paper read by Dawson and Woodward on 18 December and evidently submitted to *Nature* prior to the meeting)

Anon. 1912f. A Palaeolithic skull / First evidence of a new human type. *The Times*, 19 Dec, 4. (Report of a meeting at the Geological Society of London on 18 Dec, at which a formal presentation was made on the discoveries at Piltdown. Dawson is here reported as stating that the first skull fragment was handed to him 'four years ago', i.e. about 1908. In his own published accounts Dawson was more vague about the date.)

Anon. 1912g. A hard nut to crack for Christmas / Have we really found the 'missing link' at last? *The Graphic*, 28 Dec. (Not seen)

Anon. 1913a. Wizard of Sussex. *Daily Express*, 4 Jan. (An account of the career of Charles Dawson as amateur palaeontologist and antiquarian, with a photograph of Dawson & Woodward digging at Barkham Manor, provided by Dawson. Not seen)

Anon. 1913b. England's most ancient inhabitant. *American Review of Reviews*, **47** (Feb), 229–230. (Largely quotes from Pycraft 1912 and the London journal *Public Opinion*. Also included is a cartoon from the *Swansea Herald* which shows a 'Party Politician' holding aloft an apelike skull and remarking to another, 'See how even in this distant progenitor of ours we may trace those traits which, evolving through the ages, reach their almost divine development in us', with the caption 'The cerebral formation insignificant; the jaw superb'. The cartoon is reproduced in Blinderman 1986, 54.)

Anon. (H. R. H.) 1913c. The Sussex skull. *Hastings and St. Leonards Observer*, 15 Feb. (A witty poem, reproduced in part as a frontispiece to this *Bibliography*)

Anon. 1913d. The Piltdown skull. *The Times*, 25 Feb, 10. ('The Piltdown skull has now been formally presented to the British Museum, Mr. Charles Dawson F.S.A., F.G.S., the discoverer, and Mr. G. M. Maryon-Wilson, the owner of the gravel-pit, having made over to the Trustees their respective rights and interests in this specimen. On Saturday, after their usual meeting, Mr. Dawson gave the Trustees a short description of the skull, the associated specimens, and restorations... The specimen will now shortly be placed on public view in the large hall of the Natural History Museum, at South Kensington.')

Anon. 1913e. Geologists in Sussex. *Sussex Daily News*, 14 July. (A lengthy and detailed account of a Geologists' Association excursion to the Barkham Manor pit on Saturday 12 July, including a record of many of those who attended. [Not seen]. A photograph of the GA visit, taken by a Mr Yates, is reproduced in Weiner 1955b, plate 8 (for authorship see p. 102; the version reproduced in Spencer 1990a, 79, inscribed "Geologists at Piltdown", has been cropped). For a summary see Walsh 1996, 39–40, 228. Spencer cites another newspaper report of the meeting: H. Kidner, A field day in Sussex, *The Christian World*, 17 July.)

Anon. 1913f. The Piltdown skull: discussion on the size of the brain. *The Times*, 12 Aug, 5. (The Piltdown skull formed the most important item in the programme of the Anatomical Section of the International Congress of Medicine on the afternoon of 11 August. The meeting began at the Natural History Museum with an examination of the original specimens and a presentation by Smith Woodward before transferring to the Royal College of Surgeons where Prof. Keith presented an alternative reconstruction of the skull. In the discussion that followed, Prof. Elliott Smith agreed 'that the brain-cast as moulded by Dr. Smith Woodward did require considerable alteration.' Dr W. L. H. Duckworth expressed agreement with Keith's reconstruction of the skull, having independently come to the same conclusion. Mr Leon Williams exhibited a reconstruction of the lower jaw he had made in conjunction with Keith. Comments were also made by professors Anthony, of Paris, and Arthur Thomson, of Oxford. It would appear that Keith was the author of this report (Keith, 1950, 326). Spencer 1990b, 77, states that the now famous painting by John Cooke, 'A discussion on the Piltdown skull', purports to represent a discussion that took place at the Royal College on the afternoon in question: see Cooke 1915.)

Anon. 1913g. [Discovery of canine tooth at Piltdown] *Daily Express*, 2 Sept. (Woodward announced the discovery of the Piltdown canine at a meeting of the British Association at Birmingham on 16 Sept 1913 (Woodward 1914a), but news of the discovery, made on 30 Aug, had already found its way to the office of the *Daily Express*, whose approach to Woodward for information yielded no more than a confirmation of the discovery and a prediction that it would prove 'of tremendous importance'. Dawson wrote to Woodward on the day of the press release expressing annoyance that someone known to him had 'let out about the tooth to the "Express"'. Details from Spencer 1990b, 79, 80–81.)

Anon. 1913h. The antiquity and evolution of man. *Nature*, **92** (9 Oct), 160–162. (A well informed review of four recently published books authored by H. von Buttel-Reepen, G. F. Wright, V. Giuffrida-Ruggeri, and E. Fischer, the first three of which include remarks on Piltdown. The opinion expressed by this anonymous reviewer with respect to the brain capacity of the Piltdown skull betrays the likely hand of Arthur Keith.)

Anon. 1913i. The controversy over the discovery of "Dawn Man." *Current Opinion*, **55** (Dec), 421–422. (Recites differing views on the reconstruction of the Piltdown skull as expressed on the one hand by Smith, Woodward and Pycraft, and on the other by Keith; the two reconstructions are illustrated in dorsal view)

Anon. 1914a. [Exhibition and discussion] of implements and reputed implements of Palaeolithic and earlier age, and of flints showing various types of fracture. *Quarterly Journal of the Geological Society of London*, **70** (1), ii–xii. (This meeting, which took place 19 Nov 1913, was essentially a discussion about the eolithic controversy. Exhibitors and contributors to the discussion were J. R. Moir, F. N. Haward, S. H. Warren, A. S. Kennard, A. W. Jamieson, Prof. W. J. Sollas, Rev. H. H. Winwood, H. N. Ridley, O. A. Shrubsole, W. Dale, N. F. Robarts, G. W. Lamplugh, W. H. Cook, Reginald A. Smith, Walter Johnson, Prof. W. Boyd Dawkins and P. G. H. Boswell. The meeting was arranged by Aubrey Strahan.)

Anon. 1914b. Eskimos' extra vertebra / Members of one arctic tribe show abnormal development. *New York Times*, 2 Jan, 1. ('London, Jan. 1.—Charles Dawson, who found the famous Piltdown skull, has made another discovery of considerable interest to anthropologists. He has discovered that the members of a certain Eskimo tribe have literally more backbone than the rest of humanity; that is to say, they have one extra vertebra to which small ribs are attached. Mr. Dawson has lately been making an examination of various skeleton remains brought from the arctic regions and has found that both men and women of the

Eskimo tribe in question have this abnormal development.' The author of this 'Special Cable to The New York Times', here quoted in full, is not identified. It may have been Dawson himself. See Dawson 1912)

Anon. 1914c. [Note on progress of Piltdown excavations.] *Nature*, **94** (3 Sep), 5. ('While continuing their excavations in the Piltdown gravel last week, Mr. Charles Dawson and Dr. A. Smith Woodward met with a second portion of a molar tooth of Mastodon larger and more characteristic than the fragment originally described. The new specimen agrees well with the teeth of *Mastodon arvernensis* found in the Red Crag of Suffolk, but is merely a waterworn hindmost ridge, and is evidently a derived fossil of earlier date than the deposition of the Piltdown gravel itself.' Full text)

Anon. 1914c. Dawn Man of Piltdown. *Scientific American Supplement*, **78** (7 Nov), 296–299. (Not seen)

Anon. 1916. [Memorial to Charles Dawson, who died 10 Aug 1916] *Sussex Daily News*, Aug 11, 14, 18. (Not seen)

Anon. 1921. The Broken Hill skull. *The Times*, 11 Nov, 11. ('The directors of the company owning the Broken Hill Mine in Northern Rhodesia are presenting the recently discovered human remains to the Trustees of the British Museum, through Dr. A. Smith Woodward, Keeper of Zoology. There these relics of primitive man will join the Piltdown skull, hitherto the most remarkable fossil in the national collection... There is great hope that further fragments of human bones may be found. In particular the discovery of a lower jaw is desired.' Woodward went on to publish a formal notice of this skull, which was accompanied by stone tools, but no lower jaw was recovered. He named the find *Homo rhodesiensis*, or Rhodesian Man: Woodward 1921.)

Anon. 1924. [Interview with Arthur Smith Woodward on his retirement from the Natural History Museum] *Evening News*, 3 Mar. (Woodward readily admitted that the Piltdown discovery had been 'the most important thing that ever happened in my life.' Cited in Walsh (1996, 4, 224) who quotes, from the same interview, Woodward's recollection of finding the canine, *ibid*, 43.)

Anon. (M.S.R.-G.) 1935. Modern South Saxons: No. 74–Sir Arthur Smith Woodward, LL.D., F.R.S., F.G.S., F.Z.S., F.R.G.S. *Sussex County Magazine*, **9** (2) Feb, 74. (Woodward retired as Keeper in the Geological Department of the Natural History Museum in 1924 and was knighted in the same year, '...and he came to live in Sussex to be near Piltdown. He still explores the remarkable gravel deposits in which the discovery he was the first to record, was made.'))

Anon. 1938. The Piltdown Man discovery: unveiling of a monolith memorial. *Nature*, **142** (30 July), 196–197. (Includes substance of a speech by Sir Arthur Keith delivered at the unveiling of a memorial stone in the grounds of Barkham Manor, Piltdown, on 23 July, marking the spot where the Piltdown skull was found. A report of the unveiling also featured in *The Times*, 23 July, p. 9. See also Spencer 1990b, 179–180, for additional information.)

Anon. 1944. Obituary: Sir Arthur Smith Woodward, F.R.S: research in extinct Vertebrata. *The Times*, 4 Sept, 6.

Anon. 1953a. Piltdown Man forgery / Jaw and tooth of modern ape / "Elaborate hoax". *The Times*, 21 Nov, 6. (*The Times* newspaper was the first to break the startling news concerning the findings of Weiner, Oakley & Le Gros Clark on the fraudulent nature of the Piltdown jaw and canine. Reports subsequently featured in the *Evening Standard*, 21 Nov; *The Star*, 'The biggest scientific hoax of the century', 21 Nov; *The People*, 'Great missing link hoax rocks scientists', 22 Nov; *News Chronicle*, 23 Nov; *Daily Express*, 'Did Charles Dawson give Mr Piltdown his fake jaw?', 23 Nov. For other examples of press coverage see Turrill 2006, who also records a number of editorial cartoons that appeared at this time, including Illingworth 1953, and Lancaster 1953.)

Anon. 1953b. More doubts on Piltdown Man / Second discovery suspect / Implements stained artificially. *The Times*, 23 Nov, 8. (Within days of the first announcement it became evident that material from Piltdown II was also considered to be fraudulent, and other items were now under suspicion)

Anon. 1953c. Motion tabled on Piltdown Man. *The Times*, 25 Nov, 8. (Several members of Parliament have tabled a motion of 'no confidence' in the Trustees of the British Museum in light of the Piltdown fiasco 'because of the tardiness of their discovery that the skull of the Piltdown Man is partially a fake.' See Anon. 1953g for outcome.)

Anon. 1953d. Piltdown Man hoax / Protest against “attacks”. *The Times*, 26 Nov, 5. (Report of the meeting which took place on 25 Nov at the Geological Society, at which Dr A. T. Marston launched an angry protest against the British Museum for besmirching Dawson’s character in order to cover up their own ineptitude. He had received a letter from Barkham Manor confirming Dawson’s integrity. ‘They should not attack this man’ he insisted, adding ‘Let them try to tackle me.’)

Anon. 1953e. Disclosures welcomed. *The Times*, 26 Nov, 5. (‘From our own correspondent, New York, Nov. 25: Father Pierre Teilhard, of the Wenner-Gren foundation for anthropological research, New York, who, as a young student, visited the Piltdown workings several times and on one occasion picked up and handed to the late Sir Arthur Smith Woodward the canine tooth which now has been found to be not that of a human but of an ape, has commented here on the latest disclosures concerning the Piltdown Man. From his acquaintance with Woodward and Charles Dawson, he said, it was virtually impossible to believe that Dawson, and still less Woodward, could have been guilty of a hoax. It was a gain for anthropology, he added, that the hoax had been exposed—as had been done by Dr. Oakley and his associates—but its origin remained a great problem, and one could only speculate on what might have happened.’)

Anon. 1953f. Geologists in row about that skull. *Daily Herald*, 26 Nov, 3. (Report of the meeting which took place at the Geological Society on 25 Nov; see also Anon. 1953d, Oakley 1954a, Weiner 1954a)

Anon. 1953g. Piltdown skull / The Speaker’s rejoinder. *The Times*, 27 Nov, 5. (There was some light hearted debate in the House of Commons in response to a motion of ‘no confidence’ in the Trustees of the British Museum in light of the Piltdown fiasco, which ended in the motion being withdrawn. Summarised in Spencer 1990b, 205–206.)

Anon. 1953h. Status of Piltdown Man defined / Museum exhibition. *The Times*, 3 Dec, 10. (‘Piltdown Man is the subject of a special exhibit that will be open to the public from to-day at the Natural History Museum... The Piltdown braincase is still regarded as a genuine fossil of Upper Pleistocene age.’)

Anon. 1954a. 1906 skull was not the Piltdown find. *Sussex Express and County Herald*, 1 Jan. (A Mrs. Florence Padgham told an *Express* reporter that in 1906 her father, Mr. Owen Burley, gave to Charles Dawson a skull which was said to have been dug up in Ashdown Forest, Sussex. The skull was ‘brown with age, and had no lower jawbone, and only one tooth in the upper jaw.’ Dawson said ‘You’ll hear more about this, Mr. Burley.’ Mrs Padgham thought that the skull might be that which Dawson claimed to have found at Piltdown in 1912, but the reporter discounts this theory because the Ashdown Forest sand would not favour the fossilisation of a skull, which must therefore have been of comparatively recent date.)

Anon. 1954b. Scientists and the press: the Piltdown skull hoax, an unfair discrimination. *Manchester Guardian*, 12 Jan, 5. (Report of a speech given to the Royal Society of Edinburgh on 11 Jan, by Lionel F. J. Brimble, joint editor of *Nature*, who expressed dismay at the decision of the Natural History Museum to give *The Times* an exclusive release concerning the Piltdown findings, rather than have an open press conference; see background to this in Spencer 1990b, 203.)

Anon. 1954c. The Piltdown bones and ‘implements’. *Nature*, **174** (10 July), 61–62. (Summary of papers presented at a meeting of the Geological Society on 30 June devoted to the exposure of the Piltdown fraud. Following a paper by A. T. Marston, who opposed the claim that the jaw and canine had been deliberately faked, Sir Gavin de Beer, Director of the British Museum (Natural History) introduced a series of papers and exhibits by W. E. Le Gros Clark, J. S. Weiner, S. H. U. Bowie & C. F. Davidson, G. F. Claringbull & M. H. Hey, and K. P. Oakley, conclusively demonstrating the fraudulent nature of the entire Piltdown assemblage. The writer adds that ‘More than five hundred [actually >300: see note under Parker 1981] articles and memoirs are said to have been written about Piltdown man. His rise and fall are a salutary example of human motives, mischief and mistake.’ A detailed report of the meeting also appeared in *The Times*, 1 July, p. 4.)

Anon. 1954d. Piltdown Skull Site. *Report of the Nature Conservancy*, year ended 30 Sept 1954, 25. (‘As a result of the discovery during the year that the Piltdown jaw was not genuine and that none of the “Piltdown” remains could be definitely attributed to the site, the Conservancy decided to revoke the declaration of the Piltdown Skull Site as a National Nature Reserve. Arrangements are being made to hand it back to the Barkham Manor Estate on condition that scientists accredited by the British Museum (Natural History) have access to the site; that the memorial stone is not removed; and that the windows of the trench exposing the gravel in which the bones were alleged to have been found are left intact, in case the gravel should be required for further study.’)

Anon. (C.F.E.B.) 1954e. Charles Dawson, the Piltdown skull mystery man:– 1. Incapable of trickery, but he faked castle dungeon. *Sussex Express and County Herald*, 19 Nov. ('What kind of a man was Charles Dawson, the Uckfield solicitor who, over 40 years ago, produced archaeological specimens that are now held to be fakes? ...an "Express-Herald" special investigator has interviewed many of the people who were closely associated with Dawson. They have told an amazing story—the story of a man whom, his close associates say was morally incapable of trickery, and yet who, others who knew him well say, would stop at nothing in carrying through a hoax.' He was educated at the Royal Academy, Gosport, where 'he was considered an average scholar, fairly conscientious and studious, but always ready for a practical joke.' Miss Mabel Kenward well remembered Dawson in his capacity as steward of Barkham manor, then tenanted by her father: "I do not know what my father would have said about Mr. Dawson being accused of hoaxing and forgery. He thought the world of Mr. Dawson, who was of the highest integrity. He was genial, benign and kind, and I do not think he had the capabilities to fake the skull." On the other hand, a former articulated pupil of Dawson's could recall an occasion in 1908 when Dawson discovered a long-forgotten wine cellar in his garden at Castle Lodge, Lewes, which, with the pupil's help, he turned into a fake dungeon belonging to the castle. "It was a fake from start to finish, but papers were read about it at meetings, and Charles Dawson just chuckled. Yes, he was a great leg-puller." On the identity of the 'former articulated pupil' see Anon. 1955a.)

Anon. (C.F.E.B.) 1954f. Charles Dawson, the Piltdown skull mystery man:– 2. When he took the Sussex archaeologists' HQ for his home. *Sussex Express and County Herald*, 26 Nov. (With respect to Dawson's underhand purchase of Castle Lodge and eviction of the Sussex Archaeological Society, of which he was a member, in 1904, it is stated that on 6 May 1907 the Society 'agreed to buy Barbican House, a stone's throw from Castle Lodge, from Mr. Harry Willett for £2,300, and on June 17, 1908, the new premises were formally opened with an inaugural luncheon at Lewes Town Hall... Dawson was among those who attended the luncheon and heard Canon Cooper [J. H. Cooper, the Society's Chairman] say that the society were at Castle Lodge until about four years ago when they "were eliminated through what Mr McKenna (Chancellor of the Exchequer) would call a pitiless injustice." Dawson had purchased Castle Lodge in preparation for his marriage, and a description is given of the groom's opulent pre-wedding day reception at Uckfield where he was presented with a silver tea tray by members and officers of the Uckfield Urban Council. In his speech Dawson said "It is very kind of you to have remembered my love of the antique in choosing this magnificent tea tray. As you know, I love everything that is old—old times, old manners, old friends.")

Anon. (C.F.E.B.) 1954g. Charles Dawson, the Piltdown skull mystery man:– 3. Gravel pit that became world famous site. *Sussex Express and County Herald*, 3 Dec. (The writer interviewed Miss Mabel Kenward, formerly of Barkham Manor but now living at Little Sharpes, Piltdown. Miss Kenward said that after Dawson was given what the workman claimed was a piece of 'coco-nut' he afterwards 'visited the site on many occasions and searched the heaps of gravel, but it was not until several years later that he found a second piece of the skull which fitted one broken edge of the piece given to him by the men. Three more pieces were eventually unearthed.' Miss Kenward stated that "Mr. Dawson and Sir Arthur frequently had tea at our home after their digging in the pit. When they found the missing pieces of the skull the others were excited, but not Mr. Dawson. He remained his calm, genial self." Perhaps Mr Dawson had no reason for surprise!)

Anon. (C.F.E.B.) 1954h. Charles Dawson, the Piltdown skull mystery man:– 4. *Sussex Express and County Herald*, 10 Dec. (Not seen. Edited extracts from the four articles by C.F.E.B. appear in Pitts 2004. On the identity of C.F.E.B. see the suggestions of Padgham, D. 2004 and Russell 2004, neither of which is convincing.)

Anon. 1954i. Site of Piltdown skull "discovery" no longer nature reserve / doubts about museum exhibits. *Archaeological News Letter*, 5 (7) Dec, 127. (Not seen.)

Anon. 1955a. Two skulls behind a panelling—were they prototypes for Piltdown Man? *Daily Mail*, 6 Jan. (This story is based on an interview with Dr Pat Nicholl, the occupant of Castle Lodge, Lewes, who recounts an event from his boyhood which occurred before the Second World War. "I was on holiday from school. My father had taken on a locum to look after the practice. Some workmen arrived to put right the dry rot to wainscoting near the window-bay. They chiselled away the wood and there, in the cavity between the panelling and the wall, they found two skulls. The workmen naturally thought they were human skulls connected with some tragedy or murder long ago in Lewes Castle. But when the locum doctor, Dr. Maclean, came in from his rounds he examined each of the skulls in turn. "They are not human skulls," he declared. "They are the skulls of two large apes." There was no more talk about it... Dawson had been dead about 17 years at this time..." The reporter wonders whether these skulls were the prototypes for Piltdown Man. "Six miles away at Uckfield, Dawson had his office. There are still people who remember his queer "kitchen" in a corner of his room. It was only a large saucepan and a gas-ring, but all day long strange old bones

simmered on it.' In Aug 1954 Weiner had spoken with Dr Nicholl's father, the old nurse, the gardener and the foreman who had done work 20 years before, but could find no one to corroborate the story reported here. Nicholl jnr had been aged six at the time. Weiner reported the matter in a letter to Le Gros Clark (Spencer 1990b, 216–7). Also included in this feature is an account of Dawson's faked castle dungeon (see Anon. 1954e) where the articulated clerk who provided the story is here named as Mr R. A. Niedermayer.)

Anon. 1955b. Dawson and the tooth. *Daily Mail*, 7 Jan. ('In their frenzied search for new scientific evidence in the great Piltdown hoax, the scientists have unaccountably overlooked the evidence of Mr. Dorren Ditch, Dawson's former dentist.' Mr Ditch was inclined to suspect Smith Woodward just as much as Dawson. He 'recollected the very strange meeting which had taken place between him and Dawson years ago. It was in the first-class carriage of an afternoon train between Uckfield and Lewes. After some casual conversation Dawson fumbled in his pocket, then took out a tooth and showed it to his friend the dentist. "What do you make of that, Ditch?" he asked. Mr. Ditch recognised it for a lower canine human tooth, and told Dawson so. "It was not a fossil tooth or I should have remarked upon that fact...Yet when Dawson showed me the tooth, I think it was either said or inferred by him that he had found it in the gravel bed at Piltdown... It appeared to be a human tooth, but it might have been that of one of the larger apes. At the time, the question of whether the tooth was human or not didn't enter into our discussion. Dawson seemed more concerned with the size of the tooth and which side of the jaw it might have come from." Also interviewed was L. F. Salzman, who said "The truth about Dawson is coming out at last. Soon the world will know what I have known for 50 years. Dawson tried to play me a malicious trick which I have never forgotten. If it had succeeded, the consequences to me in the world of archaeology might have been very serious. It all showed his character..." He goes on to record Dawson's attempt to sabotage his election to a learned society (Society of Antiquaries). "Fortunately the news of what was happening came to my ears and I was able to counter Dawson's fiendish plot.")

Anon. 1955c. The "tragedy of Piltdown", Sir Arthur Keith's opinion revealed. *Sunday Times*, 9 Jan, 1. (A few weeks before his death on 7 Jan 1955, Keith had written to a friend about Piltdown. In this letter, which is quoted at length on the front page of the *Sunday Times*, Keith was in no doubt that he and Smith Woodward had been completely deceived by the 'honest' countenance of Charles Dawson. He said that "The tragedy of the situation is a loss of faith in the testimony of our fellow workers. That is how the Piltdown fraud strikes me.")

Anon. 1955d. Mr. Dawson's mystery. *The Times*, 17 Feb, 11. (Review of Weiner's *The Piltdown Forgery*. 'The great merit of Dr. Weiner's account of the affair of the Piltdown skull is that he makes the reader understand the reasons behind its every stage. He shows why the hoax took the form it did; why scientists in 1912 were in a mood to be deceived in this particular way; and why the increase of knowledge upon other aspects of the history of man's development eventually made the discoveries impossible to reconcile with established facts. The book is lucidly written, though there are some minor signs of hasty compilation.'))

Anon. 1962. 6 birds struck off British list as frauds: Hastings 'catches' may have been imported in refrigerators. *The Times*, 10 Aug, 8. ('Six birds are to be struck from the official British list because two leading naturalists after eight years' research with scientific help have come to the "painful and shocking" conclusion that the records are false... Out of the 49 birds added to the official British list between 1903 and 1916 no fewer than 32 were from Hastings—the "Hastings Rarities" as they came to be known. Yet since 1919 Hastings has contributed only two new British birds. "Did rare birds, then, so greatly prefer Hastings to everywhere else, and if so why did they suddenly cease to do so?" the two naturalists ask. "Or can it have been that in crediting this part of the world only with the Piltdown deception, we have hitherto missed recognizing an imposture of even greater magnitude?" Most of these rarities had been brought to a Mr George Bristow, a taxidermist and gunmaker at St Leonards-on-Sea, who concealed his sources. It is not known whether Bristow was responsible for the frauds, or whether he was the victim of someone else. The article prompted a response from Harrison, J. M. 1962. In due course it would become apparent that Bristow had been acquainted with Charles Dawson. For further information see under Harrison, J. M. 1968.)

Anon. 1972a. Quick guide: [book review] *The Piltdown Men*, by Ronald Millar. *The Times*, 10 Aug, 10. ('A new candidate for the immortal hoaxer who foisted the fabulous hominid on the scientific world. Mr Millar sketches a plausible case but cannot clinch it. Poor Dawson is denied his place with Clifford Irving and Van Meegeren, partly on the grounds that the hoax was too skilful for a layman, and too crude for him to hope to get away with it. But it is one of those detective stories where ten chapters of scene-setting precede the crime. Once it starts, the story is intriguing, full of crusty professors; it might go well as a stage adaption.'))

Anon. 1972b. Monkey business. *Times Literary Supplement*, 29 Sep, 1136. (This is evidently a review of Ronald Millar's *The Piltdown men*. Cited in Turrill 2006. It prompted a response from Zuckerman, S. 1972)

Anon. 1973. *The Piltdown Man hoax*. London: British Museum (Natural History), Palaeontology Leaflet no. 2, 7 pp. (A short and authoritative summary of the affair, which avoids entering the whodunit debate)

Anon. 1978. Piltdown Man won't lie down. *New Scientist*, **80** (2 Nov), 343. (With reference to the tape-recorded views of Prof. James Douglas, as reported by Halstead 1978, the Natural History Museum admitted that 'other tape recordings exist with denouncements, but these are time-sealed until the deaths of their makers'. With regard to the rumour that one of these might be by Kenneth Oakley, see Turriffin 2006, 30; see also statement by Vernon Reynolds under Chatwin, C. P.)

Anon. 1981. Obituary: Dr Kenneth Oakley / Exposure of the Piltdown hoax. *The Times*, 5 Nov, 14.

Anon. 1982. Obituary: Prof Joseph Weiner / Decisive role in the exposure of the Piltdown hoax. *The Times*, 16 June, 14.

Anon. 1983. Arthur Conan Doyle is Piltdown suspect. *New York Times*, 2 Aug, C1, C6. (See Winslow & Meyer 1983a)

Anon. 1990. American detective finds fresh clues to Piltdown mystery. *New Scientist*, **126** (16 June), 26. (A pre-publication announcement of the findings of Spencer 1990a, due to appear in the autumn. The feature focuses on Spencer's allegation that 'The true architect of one of the most celebrated scientific hoaxes, that of the Piltdown man, was Sir Arthur Keith...')

Anon. 1991. Review: Frank Spencer. *Piltdown: a scientific forgery*...1990. *Antiquity*, **65**, no. 248 (Sept), 725. ('Provides a definitive account of the greatest archaeological hoax of them all... In a final chapter, Spencer identifies the crook as – in his view – the anatomist Sir Arthur Keith, who has not been so accused before [but see Turriffin 2006, 22–24]. The crucial evidence concerns the notice which Keith contributed to the issue of the weekly *British Medical Journal* published just after the Piltdown skull was announced to a scientific public. Spencer finds this decisive proof of Keith's being the hoaxer, but an innocent explanation may also be found in the speed of the *Journal's* printing schedule, which would allow an article to be revised not many hours before the number was printed.')

Anon. 1996. Unraveling Piltdown, by John Evangelist Walsh. [Book review]. *Scientific American*, **275** (4) Oct, 99. ('John Walsh frames the story as a very entertaining whodunit. Disputing several recent theories, he points the finger back at the most obvious culprit: Charles Dawson... The wrap-up is unsurprising and unsatisfying, however, as Walsh supplies no persuasive motive and uncovers no smoking gun.' The reviewer had clearly not read the book very closely: see for example Hammond, N. 1996, or Walsh 1996, 189–90, 205.)

Anon. 2001. Obituaries: Professor E T 'Teddy' Hall: scientist who exposed the Piltdown Man as a forgery and dated the Turin Shroud to between 1260 and 1390. *Daily Telegraph*, 17 Aug, 27. ('In 1953, Teddy Hall used X-ray fluorescence to show that the [Piltdown] bones had been stained with potassium dichromate to make them look fossilised; the jawbone was later proved to be that of an orang-utan, and Hall found iron filings, indicating that someone had filed down the teeth to make them look more human. Various theories were put forward about Piltdown Man, with at least 10 men...accused as the forger. Hall was always of the view that Dawson, a proven fraudster in other fields, was the villain.')

Anon. 2013. Bibliography of published works relating to the eolithic controversy. 24 pp. University of Kent, School of Anthropology & Conservation: www.kent.ac.uk/sac/research/files/Eolith_bibliog.pdf2013-08-08

Abbott, W. J. L. 1905. Machine-made eoliths. *Man*, **5**, 146–148. (A response to the claim by Boule 1905 that all the more characteristic forms of eoliths can be observed in the fractured flints produced at the cement mills in the commune of Guerville, near Mantes, France. Abbott was a staunch defender of eoliths as artefacts. Cited in Spencer 1990a)

Abbott, W. J. L. [1910]. The older prehistoric races of Sussex. *Transactions and Journal, Eastbourne Natural History, Photographic and Literary Society*, **4**; also privately printed, 8 pp. (Argues that 'On the plateau above Eastbourne and other places through the county, and even in the valleys... can be found... early relics of Pliocene man', evidence of which is provided by their 'eolithic' or, as the writer prefers to call them, pre-Palaeolithic implements. Abbott would later claim credit for having stimulated Dawson's interest in the search for Pliocene man in Sussex, e.g. letter to Smith Woodward, 15 Dec 1912, in Spencer 1990b, 36.)

Abbott, W. J. L. 1913. Pre-historic man: the newly-discovered line in his evolution. *Hastings & St. Leonard's Observer*, 1 Feb. (On the view that mankind developed along more than one line, argues a close affinity between the Piltdown jaw and that of a chimpanzee, based on a comparative examination of many modern and fossil jaws in his possession. As regards the age of the Piltdown assemblage, he confidently asserts that 'we have at last discovered the Pliocene ancestor of at least one branch of modern man...')

Abbott, W. J. L. 1914. The Piltdown skull. *Morning Post*, 2 Jan. (A characteristically bombastic attack on 'unwarranted oracular pronouncements' in the press concerning the geological age of *Eoanthropus*, for which the writer argues a Pliocene date. More specifically, this was an attack on the attempt by Dawkins 1913b to exclude Tertiary man from the Piltdown discussions.)

Abbott, W. J. L. 1916. The Pliocene deposits of the south-east of England. *Proceedings of the Prehistoric Society of East Anglia*, **2** (2), 175–194. (Considers the Piltdown gravels to be of early Pliocene date, p. 187. Paper read at Norwich, 13 Dec 1915)

Abbott, W. J. L. (for obituary see Keith 1933; see also remarks by Kennard 1947, and Edmunds 1953. For a discussion of Abbott as a suspect in the Piltdown forgery see Turrittin 2006, 18.)

Adeloye, A., Kattan, K. R. & Silverman, F. N. 1975. Thickness of the normal skull in the American Blacks and Whites. *American Journal of Physical Anthropology*, **43** (1), 23–30. (Cited in Tobias 1992c)

Adler, I. 1957. *Monkey business: hoaxes in the name of science*. New York: John Day, 128 pp. (Ch. III. Monkey business in Piltdown, pp. 37–63. Essentially a restatement of the findings of Weiner 1955b.)

Adloff, P. 1914. Walkhoffs Kariestheorie und die Umformung d. menschlichen Kiefer und Zähne seit der Diluvialzeit. *Deutsche Monatsschrift für Zahnheilkunde*, **32**, 169–196. (Criticism of Walkhoff 1913; refers to Piltdown, pp. 175, 195. Not seen)

Allcroft, H. 1916. Some earthworks of West Sussex. *Sussex Archaeological Collections*, **58**, 65–90. (The writer is critical of Charles Dawson's excavation of the Lavant Caves near Chichester, which he considers was executed in an unsatisfactory manner and was never formally published, pp. 68–74. While recognising the difficulties created for the excavators by subsidence, he nonetheless complains that 'The skill of a north-country miner would have dealt easily with the matter at the outset, and enabled the whole area to be cleared, searched and planned. As it is, the Caves, it is to be feared, are now lost for all time, and their secrets with them, while even the few "finds" are difficult of access to the majority.')

Allen, J. 2010. The curious history of the Talgai skull. *Bulletin of the History of Archaeology*, **20** (2), 4–12. (Including its links with Elliot Smith and the Piltdown skull. See comments under Langham 1978, and Smith, S. A. 1918.)

Anderson, R. B. 1996a. The case of the missing link. Part 1. Piltdown perpetrator exposed. *Pacific Discovery*, **49** (2), 15–20. (See under Anderson 1997 for comments. Walsh 1996, 259, included an analysis of this paper as an added note in his *Unraveling Piltdown*, but had to admit that 'it is hard to decide whether the article is meant to be taken quite seriously.')

Anderson, R. B. 1996b. The case of the missing link. Part 2. The solution. *Pacific Discovery*, **49** (2), 32–33.

Anderson, R. B. 1996c. Clarification from Dr. Watson. *Pacific Discovery*, **49** (3), 48. (Not seen)

Anderson, R. B. 1996d. Piltdown. *Pacific Discovery*, **49** (4), 45–46. (A reply to Drawhorn 1996. Not seen)

Anderson, R. B. 1997. The case of the missing link. In: *Physical anthropology 97/98* / edited by E. Angeloni. Guilford, Conn: Dushkin/Brown & Benchmark, pp. 138–146. (A reprint of his 1996 papers in which the writer attempts to resuscitate the case against Sir Arthur Conan Doyle as the perpetrator of the Piltdown forgery based on research by Richard Milner of the American Museum of Natural History. The writer claims to have solved a puzzle left by Doyle in his novel *The Lost World*, published in 1912. Evidently the solution leaves little doubt that Doyle was behind it. The author notes that John Winslow had compiled a lot of circumstantial evidence against Doyle (Winslow & Meyer 1983), but had 'failed to find a smoking gun.' He had also failed to notice the puzzle—a cunning cryptogram. In this respect he is not alone! See comments under Gornall 2003a–b. Anderson's 1996 papers prompted reactions from Washburn 1996, Drawhorn 1996, and Elliott & Pilot 1996; for others see Turrittin 2006, 19.)

Andrews, P. B. S. 1953. Piltdown Man. *Time and Tide*, 12 Dec, 1646–1647. (Also anonymous comment, *ibid*, 19 Dec, 1678. Cited in Turrittin 2006)

Andrews, P. B. S. 1974. A fictitious purported historical map. *Sussex Archaeological Collections*, **112**, 165–167. (The map purports to show Maresfield Forge in 1724, including Pilt Down, and was used to illustrate a paper by W. V. Crake in 1912, where it is described as a copy ‘made by C. Dawson, F.S.A.’ In 1931 the map was reproduced, from the same block, in Ernest Straker’s *Wealden Iron*, and has been accepted as valid evidence in subsequent studies in industrial archaeology. The map is wholly fictitious however, and the article by Crake makes no explicit reference to it. Fifteen specific errors and anomalies have been identified by reference to parish records and estate plans. These include the absence of provenance or internal title, distortions of scale, use of anachronistic and inconsistent scripts, and depiction of features which did not exist at the time. See Combridge 1981, where the map is credited to John Lewis. Russell 2003, 258–260, assuming Lewis’s authorship, suggests that the accommodation of Piltdown on the map, which required a serious distortion of scale, ‘was a clever attempt to point the finger of suspicion at both Dawson and his latest discovery at Piltdown.’ The insertion of the map would have required the connivance of the editor, L. F. Salzman(n), who was certainly no friend of Dawson. See further remarks under Crake 1912. By the time this paper was published Andrews had died, but early in 1974 he had been interviewed on the subject of the Maresfield map for a feature in *The Times* (Howard 1974). See also Pettitt 1975, who seems to have researched the map’s discrepancies independently of Andrews.)

Anthony, R. 1913. Les restes humains fossiles de Piltdown (Sussex). *Revue anthropologique*, **23** (Sept), 293–306. (Accepts the association of the Piltdown jaw and skull, but does not believe that Piltdown Man constitutes a new genus; he proposes the name *Homo dawsoni* in place of *Eoanthropus dawsoni*)

Ashmore, M. 1995. Fraud by numbers: quantitative rhetoric in the Piltdown forgery discovery. *South Atlantic Quarterly*, **94**, 591–618; reprinted in *Mathematics, science and postclassical theory* / edited by B. Herrnstein-Smith & A. Plonitsky. Durham, NC: Duke University Press, 189–211. (A criticism of the use of numerical data in the early analyses of the Piltdown forgery. Not seen)

Austen, R. A. C. 1851. On the gravel-beds of the valley of the Wey. *Quarterly Journal of the Geological Society of London*, **7**, 278–288. (As a postscript to this account, which is actually concerned with Surrey, the author adds the following remarks: ‘It forms no part of the present communication to explain the nature of the Wealden denudation. Sir Charles Lyell still maintains the view that the denuded area was once occupied by an expanse of water of which the escarpments of the chalk were the bounding cliffs, and in immediate juxtaposition to this view, and as proof and illustration of the theory, he describes the gravel-beds at Barcome [Barcombe]. It may suffice for the present to state that this accumulation contains the remains of the large mammalian fauna, and that in every respect its history is identical with that of the valley-gravels of the Wey and the Mole.’ The Pleistocene gravels of the Wey, in west Surrey, contain the remains of ox, elephant and deer. See comments under Godwin-Austen.)

Baden-Powell, D. F. W. 1950. The Pliocene-Pleistocene boundary in the British deposits. In: *International Geological Congress: report of the eighteenth session, Great Britain, 1948. Part IX. The Pliocene-Pleistocene boundary* / edited by K. P. Oakley. London, 8–10. (‘In the well-known sequence in East Anglia, the Pliocene-Pleistocene boundary would come as low as the base of the Coralline Crag, if Lyell’s definitions of the Pliocene, based on the percentages of living species among the fossil marine mollusca, were taken literally. At the other extreme, some British geologists have only counted the Glacial Series in this district as belonging to the Pleistocene, leaving the Cromer Forest Bed as Pliocene in addition to the Coralline, Red, Norwich and Weybourne Crag. If an intermediate point of view is taken, either the Norwich Crag or the Red Crag can be considered as the Lower Pleistocene; of these two alternatives, there is a slight preference for placing the boundary line at or near the base of the Red Crag, partly because this seems to be the earliest zone in which *Elephas meridionalis* appears, and also because the marine mollusca of the Red Crag reflect the beginning of the climatic deterioration which foreshadowed the Pleistocene Ice Age.’ This leaves only the Coralline Crag and the Suffolk Bone Bed remaining in the East Anglian Pliocene. See also King, W. B. R. 1955, and King & Oakley 1950.)

Baines, J. M. 1954. Museum exhibits discredited / Piltdown skull man’s “finds” / Plagiarism in history. *The Times*, 15 Nov, 8. (Report of an interview with John Manwaring Baines, Curator of Hastings Museum, who accuses Charles Dawson of having shamelessly plundered an unpublished manuscript by William Herbert for his *History of Hastings Castle*. The Beauport Park statuette and other Dawson specimens held by the Museum are also considered to be suspect. Baines derived the latter information from the unpublished and ongoing research of R. L. Downes, who is not here credited. The article prompted reactions from Downes 1954 and Thorne 1954. Baines was also interviewed by T. F. Thompson for the *Daily Mail*, and see also Cockburn, C. 1954.)

Baines, J. M. 1986. *Historic Hastings*. 2nd ed. amended and revised. St. Leonards-on-Sea: Cinque Port Press Ltd, xix, 438 pp. (An addition to this edition, the work having first been published in 1955, includes a short discussion of Dawson's *History of Hastings Castle*, in which the writer considers that Dawson did not give sufficient credit to William Herbert's early manuscript history as a major source for his own work. 'In his work Dawson acknowledged his great indebtedness to Herbert's work in two lines towards the end of his five-page preface and in such a way that it suggested this referred solely to [Herbert's 1824] excavations... comparison with Dawson's printed *History* showed that it was largely an extended version of Herbert's work and that the real credit should have gone to him. Instead of a few lines tucked away towards the very end of his preface, it would have been more gracious and honest to have acknowledged his great indebtedness at its very outset' (p. xii). On p. 164 there is a short note concerning the 'Oar Mace' which 'was found by the late Charles Dawson in a pawn-broker's shop in Canterbury' and misinterpreted by him. See Thompson 1954.)

Baines, J. M. 1997. Charles Dawson: the saga continues. *Hastings Area Archaeological Research Group Journal*, new ser, no. 3 (May), 5–6. (Discussion of the forged brick-stamps from Pevensey, describing the writer's first encounter with Dr D. P. S. Peacock of Southampton University and the circumstances that led to the brick-stamps being dated by thermo-luminescence; see Peacock 1973. This account is stated to be from the writer's 'recently completed' autobiography *Curator unmasked*, said to be awaiting publication, and evidently containing other references to Charles Dawson. This appears never to have been published, but a carbon-copy typescript draft, in 5 loose-leaf binders, is held at the Brotherton Library, University of Leeds, Ref. MS713/1/10.)

Ball, H. W. 1974. The Piltdown forgery. *The Times*, 29 Apr, 17. (In response to suggestions of Smith Woodward's complicity in the Piltdown fraud, made by Scheuer 1974 and Daniel 1974, the writer, who is Keeper of Palaeontology at the Natural History Museum, points out that 'Woodward was the intended and all-to-vulnerable victim of the whole plot.' He notes, as stated in a Museum Leaflet (Anon. 1973), that Woodward had 'made predictions regarding the physical features of early man, and it is likely that the Piltdown fragments were "manufactured" to accord with these and with the conjectural reconstructions that were advanced at the many early scientific meetings.' The present Compiler has failed to locate any evidence of Woodward's 'predictions' as claimed in the Leaflet.)

Barlow, F. O. (Frank Orwell Barlow, 1880–1951, was a technician in the Department of Geology at the Natural History Museum who prepared the plaster replicas of the Piltdown skull. These replicas were later distributed for sale by a company in which Barlow was a partner. Grigson 1990a has accused Barlow of being Dawson's accomplice in carrying out the forgery. Barlow's motives would have been financial.)

Barrell, J. 1917. Probable relations of climatic change to the origin of the Tertiary ape-man. *Scientific Monthly*, 4 (Jan), 16–26. (Makes fleeting reference to the Piltdown jaw and cranium, p. 21, the former regarded as chimpanzee, the latter classed as *Homo dawsoni*, after Miller 1915 and Gregory 1916. The author was based at Yale University.)

Barwick, S. 1997. Scientists rake over bones of Piltdown Man. *Daily Telegraph*, 21 Mar. (Report of a light-hearted debate at the Linnean Society at which the speakers included Richard Milner arguing that Conan Doyle was the forger, Caroline Grigson arguing for F. O. Barlow, and Herbert Thomas arguing for Sir Arthur Keith. From Turrill 2006, 21.)

Bather, F. A. 1913. The Piltdown skull. *The Times*, 13 Aug, 4. ('Sir,—Dr. Keith may be correct in his restoration of the Piltdown skull; he may be correct in refusing to accept the genus *Eoanthropus* and in referring the remains to the genus *Homo*; but he is certainly incorrect if...he labels his restoration "*Homo piltdownensis*." Assuming for the moment that the individual belonged to the genus *Homo*, then it must bear either some name previously established, e.g. *Homo sapiens*, or the name *Homo dawsoni*, according as it is regarded as an old or a new species. The International Rules of Zoological Nomenclature can admit no further name...' Francis Bather was Assistant Keeper in Smith Woodward's department at the Natural History Museum. See Keith 1913c for his response.)

Bayer, J. 1931. Zum Problem der Verscheidenheit zwischen Sinanthropus-Pithecanthropus und Eoanthropus. *Forschungen und Fortschritte*, 7, 130–131. (Not seen)

Baynes-Cope, A. D. 1955. The fluorimetric determination of uranium in the Piltdown fossils. In: Further contributions to the solution of the Piltdown problem / J. S. Weiner *et al.* *Bulletin of the British Museum (Natural History)*, Geology, 2 (6), 283–284. (Fluorimetric analysis of the skull fragments, jaw and elephant molars from Piltdown I, together with the Swanscombe skull and an elephant molar from Ichkeul, Tunisia,

shows that the radiometric assays of Bowie & Davidson give a reliable figure for the uranium content of the samples examined.)

Bayzand, C. J. 1926. The Palæolithic drawing of a horse from Sherborne, Dorset. *Nature*, **117** (13 Feb), 233. (In this communication appended to Sollas 1926, the writer states that ‘At the time of the “discovery” of this drawing I was engaged at the Sherborne School in arranging the museum collections and then learnt something of the history of the find. The whole affair, as I gathered, was a trick played solely for the benefit of the science master without any idea that it would go any further. Its success was a source of much merriment at the school...and I was even invited by some to inspect the fake...’ Bayzand’s account of the affair prompted a response from the hoodwinked science master, R. Elliot Steel 1926.)

Beer, G. de 1954. [Summary of recent investigations into the Piltdown ‘finds’.] *Proceedings of the Geological Society of London*, no. 1514 (15 Sept), cxv. (Sir Gavin de Beer, Director of the British Museum (Natural History), introduced a series of papers describing the results of new investigative techniques applied to the Piltdown skull, mandible, fauna and implements. The papers, with exhibits, were presented at a meeting of the Geological Society on 2 June. The ‘investigations had led to the conclusion that the Piltdown “finds” represented an elaborate hoax. He said that the jaw had been shown by further anatomical and X-ray evidence to be almost certainly that of an immature orang-utan... Not one of the Piltdown finds genuinely came from Piltdown...’ De Beer had been preceded by Marston (1954c), who insisted that no faking had taken place. Presentations were then made by Le Gros Clark, Weiner, Bowie & Davidson, Claringbull & Hey, Oakley, and Edmunds.)

Beer, G. de 1955. Proposed rejection of the generic and specific names published for the so-called “Piltdown Man.” *Bulletin of Zoological Nomenclature*, **11** (6), 171–172.

Beetlestone, C. I. 1926. A Sussex fireback. *Sussex Archaeological Collections*, **67**, 221–222. (A Wealden iron fireback, said to be from Herstmonceux Castle, was illustrated in Dawson’s 1903 paper on Sussex iron work and pottery (plate 8m), where he attributes the fireback’s crest to the Dacre family. The crest is here shown to represent the arms of the Trevor family. It has been assumed that Dawson could have simply misidentified the crest (Russell 2003, 72–73), but the crest had already been attributed to the Dacre family by J. Starkey Gardner in his ‘Iron casting in the Weald’ in *Archaeologia*, 1898, **56** (1), 154–155, *ex inf.* Jeremy Hodgkinson. The fireback was part of Dawson’s personal collection on loan to Hastings Museum.)

Bégouën, M. 1981. [Personal reflections on Teilhard de Chardin in the light of events at Piltdown.] *Antiquity*, **55** (Mar), no. 213, 2–4. (Including commentary by the editor, Glyn Daniel. The original is in French, but a translation by Prof. Daniel Becquemont is available from the Clark University Piltdown Plot website. Bégouën encountered Teilhard on a number of occasions and was witness to his mortification on learning that the Piltdown assemblage was fraudulent. Teilhard is reported to have said ‘I can’t imagine that Dawson tried to cheat me and used me to cover such a fraud. Anyway, it is comforting to know that science has reached such a degree of fineness that it is able to disclose the best contrived frauds.’)

Behm, H. W. 1914. Ein neuer Vormenschenfund. *Prometheus*, **25**, 209–211. (Popular article on Piltdown)

Belt, A. 1935. William Ruskin Butterfield (1872–1935). *Hastings and East Sussex Naturalist*, **5**, 57–61. (Cited in Spencer 1990a)

Bennett, F. J. 1906. Machine-made implements. *Geological Magazine*, dec. 5, **3** (2) Feb, 69–72. (A response to the claim by Boule 1905 that all the more characteristic forms of eoliths can be observed in the fractured flints produced by ‘pseudo-natural, machine-made torrents’ at the cement mills in the commune of Guerville, near Mantes, France. Presents a detailed argument defending the integrity of eoliths as artefacts, including the writer’s own observations at brickyard wash-mills in Kent. Bennett published some further observations, under the same title, *Ibid*, **3** (3) Mar, 143–144.)

Berger, M. 1953. About New York. *New York Times*, 25 Nov, 18. (The following is taken from Millar 1972, 215: In his column Meyer Berger told his readers that the Piltdown hoax hadn’t caused as much astonishment at the American Museum of Natural History as might have been expected. Berger continued: Almost unanimously the men and women who work on the Oldest Races of Men series at the museum agreed twenty years or so ago that Old Piltdown was not one creature but two. They made no public issue of it for ethical reasons. There is, and always has been, a sly reference to the Piltdown exhibit in the museum as to the dual nature of the Old Boy from Sussex Downs. ‘The brain case’, says the card in the case, ‘represents a very early and human type... The lower jaw much resembles that of a chimpanzee’.)

Bergman, J. 1999. The Piltdown hoax's influence on evolution's acceptance. *Creation Research Society Quarterly*, **36** (3) Dec, 145–154. (Considers the Piltdown fraud to provide 'an excellent illustration of the difficulties inherent in drawing conclusions about evolution from the fossil record.' The author is a creationist, credited both as Gerald and Jerry Bergman.)

Bergman, G. 2003. A history of the Piltdown hoax. *Rivista di biologia / Biology Forum*, **96**, 457–484.

Bernstein, R. 1996. The real Piltdown man stands up. *New York Times*, 11 Sept, C17. (The jawbone connected to the skull bone connected to the funny bone. A review of *Unraveling Piltdown*, by John Evangelist Walsh. 'By the time you have finished his meticulous, rigorous, exciting reconstruction of the Piltdown affair, it seems impossible that anybody other than Dawson could have been responsible for it... It is also a morality tale whose Victorian characters represent ambition, gullibility and hubris. Mr Walsh makes it so easy to see through the fraud – and some did see through it even at the time – that it almost seems astonishing that so many scientists were taken in... Mr Walsh's fine book is an occasion for reflection on the human propensity for deceit and self-deception, of which Piltdown is far from the only example.')

Berry, T. 1980. The Piltdown affair. *Teilhard Newsletter*, **13** (July), 12. (A defence of Teilhard de Chardin against the condemnatory accusations of Gould, who 'has presented mainly some psychological assumptions as to Teilhard's motives that are immature, amateurish and trivial.')

Birkner, F. 1913. Die Funde von menschlichen Knochenresten bei Piltdown in Sussex (England). *Korrespondenzblatt der Deutschen Gesellschaft für Anthropologie, Ethnologie und Urgeschichte*, **44**, 102–103. (A criticism of Woodward's reconstruction of *Eoanthropus*, evidently reflecting the view expressed generally by German anthropologists at a meeting of the Deutsche Anthropologische Gesellschaft at Nuremberg in August 1913. Noted in Spencer 1990b, 76.)

Birkner, F. 1913/14. Die fossilen Menschenreste aus Piltdown in Sussex (Engl.). *Natur und Kultur*, **11**, 4–10, 14. (Not seen)

Birkner, F. 1916/17. Die fossilen Menschenreste aus Piltdown. *Natur und Kultur*, **14**, 226–228. (Not seen)

Birkner, F. 1918. Die angeblich fossilen Menschenreste aus Piltdown (Sussex, Südengland). *Korrespondenzblatt der deutschen Gesellschaft für Anthropologie, Ethnologie und Urgeschichte*, **49**, 62. (Does not now accept an association between the jaw and cranium. Cited in Quenstedt 1936)

Black, D. 1927. On a lower molar hominid tooth from the Chou Kou Tien deposit. *Palaeontologia Sinica, Series D*, **7** (1), 28 pp, 2 plates. (The first formal description of a new hominid, *Sinanthropus pekinensis*, or Peking man, from the caves at Zhoukoudian, China. The name was conferred solely on the basis of a single molar tooth. Comparisons are made with the molars of *Eoanthropus*. Subsequent excavations would reveal 14 partial skulls and 11 mandibles, as well as numerous teeth, a few skeletal bones, and many stone tools, e.g. Black 1931, Weidenreich 1936, 1937, 1943. Following the death of Davidson Black in 1934 the study of these fossils was taken up by Teilhard de Chardin and then Franz Weidenreich. With the new discoveries it became clear that *Sinanthropus* was little different from the Javanese *Pithecanthropus erectus* of Dubois 1894, now renamed *Homo erectus erectus*. Peking man is now classified as *Homo erectus pekinensis*.)

Black, D. 1931. On an adolescent skull of *Sinanthropus pekinensis* in comparison with an adult skull of the same species and with other hominid skulls, recent and fossil. *Palaeontologia Sinica, Series D*, **7** (2), 144 pp, 16 plates. (Comparison with *Eoanthropus*, pp. 76–77, including illustration of glenoid, tympanic and infra-temporal regions in left lateral-orbital parasagittal craniograms of recent, La Chapelle, *Eoanthropus* and *Sinanthropus* skulls.)

Black, D. (For correspondence connected with Piltdown see Spencer 1990b, 111–112, 164–165, dating from 1914 and 1929 respectively. Spencer states that 'From all accounts Black visited Piltdown sometime during the summer of 1914, and while there he found a fragment of a *Rhinoceras* molar. The exact date of his visit is not known.')

Blackmore, H. P. 1923. The Piltdown flints. *Man*, **23**, 98–99. (Not seen)

Blinderman, C. 1986a. The Piltdown problem solved. *Journal of Irreproducible Results*, **31** (3) Feb/Mar, 2–6. (MI5, the British Secret Service, masterminded the hoax! The author concludes that 'only the British Government could have had a motive sufficient for the initiation of this hoax and the resources to carry it out so comprehensively.' It should be noted that the *JIR* is a magazine devoted to science humour!)

Blinderman, C. [June] 1986b. *The Piltdown inquest*. Buffalo, New York: Prometheus Books, 261 pp. (Following a review of the case, each of the principal suspects is examined in turn: Charles Dawson, William Butterfield, Samuel Woodhead & John Hewitt, Teilhard de Chardin, Martin Hinton & C. P. Chatwin, Arthur Conan Doyle, W. J. Sollas, Lewis Abbott, and Grafton Elliot Smith. The author is able to come to no firm conclusion about the perpetrator, but believes that 'of all the suspects Lewis Abbott has the best credentials to be the Piltdown hoaxter.' The chapter on Conan Doyle is skilfully and amusingly presented as a Sherlock Holmes adventure entitled 'The Adventure of Queer Street', in which the ghost of Conan Doyle employs Holmes to establish whether he is innocent or guilty of the crime imputed to him by Dr John Hathaway Winslow. As is evident from the quality of his prose style, Charles Blinderman was professor of English and adjunct professor of biology at Clark University, Massachusetts. The book was reviewed by Boaz 1987, Bowler 1987, Day 1987, Spencer 1987, Marks 1988, and Thieme 1988; for other reviews see Turriffin 2006, 18. Blinderman's scanned archive of published source material is available at: http://www.clarku.edu/~piltdown/pp_map.html)

Blinderman, C. 1987. [Response to book review, by P. McGrath, of Peter Marks' novel *Skullduggery*]. *New York Times Book Review*, 20 Dec, 7.23. (Cited in Turriffin 2006)

Blinderman, C. (see also McCulloch 1987)

Blossom, S. A. 1999. Kipling as cryptographer: the Piltdown caper. Richard Harter's World website. (The writer argues that there are two hidden references to the Piltdown forgery in Rudyard Kipling's short story 'Dayspring Mishandled', published in 1928. It is suggested that Kipling, who lived 20 miles from the Piltdown site, was aware of the fraud and wrote this fictional tale of an elaborate literary hoax involving a forged manuscript attributed to Chaucer, evidently with Piltdown in mind. Weiner's attention had been drawn to Kipling's story while making enquiries in 1954; Spencer 1990b, 249–250; Turriffin 2006, 15)

Boaz, N. T. 1981. History of American paleoanthropological research on early Hominidae, 1925–1980. *American Journal of Physical Anthropology*, **56** (4), 397–405. (Understanding of the early stages of hominid evolution prior to 1925 was based primarily on the study of living primates. 'But with the publication of *Australopithecus* by Dart in 1925 and subsequent research in South Africa, new possibilities for empirical assessment of early hominid evolutionary history were opened. It was Gregory's work, with Hellman, reported at the first meeting of the AAPA in 1930, that convinced many workers of the hominid status of *Australopithecus*. The debunking of *Eoanthropus* as a Pliocene hominid, far from having a totally negative effect, showed that cranial expansion had occurred *after* bipedalism in hominid evolution, demonstrated that chemical dating had come of age, and in a broader sense, had underlined that phylogenetic hypotheses are falsifiable by recourse to the evidence.'))

Boaz, N. T. 1982. American research on Australopithecines and early *Homo*, 1925–1980. In: *A history of American physical anthropology, 1930–1980* / edited by F. Spencer. New York: Academic Press, 239–260.

Boaz, N. T. 1987. Book reviews: The Piltdown inquest, by Charles Blinderman. *American Journal of Physical Anthropology*, **74** (4), 545–546.

Bobys, R. S. 1983. Research fraud factors and effects. *Free Inquiry in Creative Sociology*, **11** (1), 44–48. (Including Piltdown. Cited in Turriffin 2006)

Bono, S. de 2005. Is the spirit of Piltdown man alive and well? *The Telegraph*, 7 Sept. ('Ever since the Piltdown man was shown to be a hoax about half a century ago, science has been haunted by the spectre of fraud. By and large, most researchers have felt themselves part of an honourable tradition of being seekers after scientific objectivity. And examples of trickery and deceit have been few and far between. However, recent studies have shaken this view and challenged it as at best complacent, at worst misleading. The major scientific crimes of fabrication, falsification and plagiarism may be only the tip of the iceberg and there is evidence of a much wider and deeper problem, not of outright fabrication of results but of distortion, omission and exaggeration. This has become such a concern that a new body – the UK Panel for Health and Biomedical Research Integrity – has just been set up to advise on the extent of malpractice...')

Booher, H. R. 1984. Scientific sleuthing at Piltdown: a case of tampering? *Impact of Science on Society*, **34** (4), no. 136, 401–404. (Not seen)

Booher, H. R. 1986. Science fraud at Piltdown: the amateur and the priest. *Antioch Review*, **44** (4), 389–407. (A detailed defence of Dawson, and an equally detailed attempt to make Teilhard de Chardin the prime suspect. Harold Booher was a senior psychologist on the Nuclear Regulatory Commission in Washington.)

Boswell, P. G. H. 1945. James Reid Moir, F.R.S. (1879–1944). *Proceedings of the Prehistoric Society*, new ser, **11**, for 1945, 66–68.

Boswell, R. 1963. Skull-diggery at Piltdown: a Baker Street irregularity. *Baker Street Journal*, **13** (3), 150–155. (Cited in Turrittin 2006)

Boucher de Perthes, J. 1847, 1857, 1864. *Antiquités celtiques et antédiluviennes: mémoire sur l'industrie primitive ou des artes à leur origine*. Paris: Jung-Treuttel, etc, 3 vols. (In this work Boucher de Perthes presented the results of many years of excavation in the river gravels around Abbeville in northern France, from which he had recovered rude stone tools together with the bones of animals now extinct in Europe such as elephant and rhinoceros. Unfortunately his illustrations were badly executed and included drawings of flints which showed no clear sign of workmanship, for one of which reasons his views were largely ignored until the question was taken up by the English geologist Joseph Prestwich in 1859.)

Boucher de Perthes, J. (Jacques Boucher de Crèvecœur de Perthes, 1788–1868, French customs official and antiquarian whose archaeological studies in the Somme river valley during the 1840s and 1850s were largely responsible for establishing the fact that human beings, as represented by their stone implements, had once coexisted with extinct mammals. His views, however, did not meet with wide approval, since many were doubtful that the flints collected by him showed clear signs of human handiwork. In 1863 his announcement of the discovery of a human jaw, together with a detached molar and a number of worked flints in a gravel pit at Moulin-Quignon near Abbeville seemed to vindicate his views entirely. Unfortunately the assemblage was soon shown to be fraudulent, having been manufactured, stained and planted by one of Boucher de Perthes' workers in response to an offer of a reward of 200 francs for finds of human remains. The forgeries were first exposed by two visiting Englishmen: the geologist Joseph Prestwich and the antiquarian John Evans. See in particular Evans 1863, Falconer 1868, Boylan 1979, 2004, Cohen & Hublin 1989, 201–221. For other early references to the Moulin-Quignon finds see Quenstedt 1936, 334–5. Boucher de Perthes, who refused to accept the English verdict, published four papers on the jaw in 1863–64. See also Meunier 1900. Later the jaw was determined to be not older than Neolithic, rather than Chellean as originally supposed, and thus, as noted by Oakley (1969, 3), 'a fraudulent intrusion – really a predecessor of Piltdown'.)

Boule, M. 1905. L'origine des éolithes. *L'Anthropologie*, **16**, 257–267. (Cited in Spencer 1990a, who states that 'In 1905, Boule's attention was drawn to the cement works near Mantes (Seine-et-Oise), west of Paris, where in the huge mixing vats clay, chalk and water were churned "at the speed of the Rhone in flood". Here, among the flints that had inadvertently been subjected to this action, Boule found forms resembling those designated by Rutot and others as eoliths.' His conclusions, that eoliths were the product of natural agencies, prompted defensive reactions from Abbott 1905 and Bennett 1906. Warren 1905a etc provided confirmation of Boule's results after carrying out his own experiments on flint.)

Boule, M. 1911. L'homme fossile de La Chapelle-aux-Saints. *Annales de Paléontologie*, **6** (3/4), 109–172 (1–64), plates XVII–XX (I–IV). (The first in series of splendid monographs describing the first complete skeleton of Neanderthal Man, discovered in central France in 1908 and subsequently designated the type specimen for *Homo neanderthalensis*. See also Boule 1912a, 1913.)

Boule, M. 1912a. L'homme fossile de La Chapelle-aux-Saints. *Annales de Paléontologie*, **7** (1), 21–56 (65–100), plate IV (V); **7** (2), 85–104 (101–120), plate IX (VI); **7** (3/4), 105–192 (121–208), plates X–XIX (VII–XVI).

B[oule], M. 1912b. L'homme fossile de Piltdown, Sussex (Angleterre). *L'Anthropologie*, **23**, 742–744.

Boule, M. 1913. L'homme fossile de La Chapelle-aux-Saints. *Annales de Paléontologie*, **8** (1) Mar, 1–70 (209–278). (Comparison with Piltdown, pp. 217, 245–246, 265–266: at this time *Eoanthropus* was only known to Boule from descriptions. A plaster cast of the La Chapelle-aux-Saints skull was exhibited by Smith Woodward at a meeting of the Geological Society of London in Dec 1913: see Dawson & Woodward 1913b.)

Boule, M. 1915. La paléontologie humaine en Angleterre. *L'Anthropologie*, **26** (Jan–Apr), 1–67. (*Eoanthropus*, pp. 39–67. Accepts the association between the skull and jaw, but points out that the jaw is exactly that of a chimpanzee, and would have been described as *Troglodytes dawsoni* if found alone. He regards Woodward's erection of a new genus as unnecessary. Boule's paper includes a barbed attack on Moir's supposed Pliocene flaked flints and on his interpretation of the Ipswich skeleton. Dawkins 1915 described Boule's essay as 'masterly'. Moir 1915 was greatly hurt by Boule's scornful attitude.)

B[oule], M. 1917. The jaw of Piltdown Man (La mandibule de l'homme de Piltdown). *L'Anthropologie*, **28**, 433–435. (Review of Miller 1915)

Boule, M. 1920. Le crâne et la mâchoire de Piltdown. *L'Anthropologie*, **30**, 394.

Boule, M. 1921. *Les hommes fossiles: éléments de paléontologie humaine*. Paris: Masson et Cie, xi, 491 pp. (L'homme de Piltdown, pp. 157–175; incidental refs, pp. 26, 52, 89, 145, 227, 229, 244–5, 444, 457. The author reaffirms his view that the Piltdown jaw does not belong with the skull but is that of a chimpanzee, while the skull itself in brain capacity is that of a relatively recent type of man.)

Boule, M. 1923. *Les hommes fossiles: éléments de paléontologie humaine*. 2nd ed. Paris: Masson et Cie, xi, 505 pp. + final page of errata. (L'homme de Piltdown, pp. 158–176; incidental refs, pp. 26, 52, 89, 145, 229, 231, 246–7, 457, 470. Boule was inclined to dismiss *Eoanthropus* as an artificial and composite being in the first edition of his book, but after considering the evidence of Piltdown II, felt obliged to change his view, though his doubts were by no means completely laid to rest: see pp. 471–2 of English edition.)

Boule, M. 1923. *Fossil men: elements of human palaeontology*; translated from the French, with an introduction, by J. E. Ritchie and J. Ritchie. Edinburgh: Oliver & Boyd, xxvii, 504 pp. (The Piltdown Man, pp. 157–175, with additional material from the second edition of Boule's *Les hommes fossiles* gathered into an appendix, pp. 471–472; incidental refs, pp. 26, 51, 89, 144, 227, 229, 243–4, 447–8, 461.)

Boule, M. 1946. *Les hommes fossiles: éléments de paléontologie humaine*. 3rd ed. by H. V. Vallois. Paris: Masson et Cie, xii, 587 pp. (L'homme de Piltdown, pp. 172–189; Henri Vallois in his preface, dated Dec 1945, remarks that 'La découverte de Swanscombe a confirmé celle de Piltdown, sans en éclaircir l'énigme', pp. vi, vii; incidental refs, pp. 23, 51, 84–5, 189, 197, 253, 255, 268, 538, 550.)

Boule, M. & Vallois, H. V. 1957. *Fossil men: a textbook of human palaeontology*; translated from the revised and enlarged fifth French edition of *Les hommes fossiles* by M. Bullock. London: Thames & Hudson, xxv, 535 pp. ('Piltdown Man', including background to the fraud, pp. 154–168; incidental refs, pp. vi, 3, 190 etc. Henri Vallois in his preface notes that the truth about Piltdown 'has dispelled one of the most irritating puzzles in human palaeontology, a puzzle to which no logical solution had so far been found or ever could have been found.')

Bowden, M. 1977. *Ape-men – fact or fallacy?* Bromley, Kent: Sovereign Publications, viii, 196 pp. (2nd enlarged edition 1981, 260 pp). (A defence of Dawson, and in particular of the circumstances attending the discovery of the first skull fragments at Piltdown. An illustration of the reassembled skull (Fig. 4) purports to show the point where damage was sustained by a blow from a workman's pick, thus supporting Dawson's account of the initial find. Dawson himself mentions 'an incision at the back of the parietal, probably caused by a work-man's pick' in Dawson & Woodward 1913, p. 121. Bowden's grasp of the technical evidence, particularly regarding the significance of gypsum in the skull fragments, is faulty. He attempts to prove, at some length, that Teilhard de Chardin planted the jaw, teeth and flints at Piltdown I, and the fossils at Piltdown II.)

Bowden, M. 1991. *Science vs. evolution*. Bromley, Kent: Sovereign Publications; 2nd ed. 2002.

Bowie, S. H. U. & Davidson, C. F. 1954a. The radioactivity of fossil bones with especial reference to the Piltdown remains. *Proceedings of the Geological Society of London*, no. 1514 (15 Sept), cxvi–cxix. (Report of a presentation made at a meeting on 2 June 1954 demonstrating the results of new investigative techniques applied to the Piltdown assemblage. See Beer 1954)

Bowie, S. H. U. & Davidson, C. F. 1954b. The radioactivity of fossil bones, with special reference to the Piltdown remains. *Report, Atomic Energy Division, Geological Survey of Great Britain*, no. 164 (1 July), [9] leaves [BGS Report WF/AG/54/164]. (Following a suggestion by the authors that radioactivity measurements might yield additional information on the much-disputed Piltdown remains, W. M. Edwards and K. P. Oakley of the Natural History Museum made available for radiometric assay a large selection of teeth and bones from Piltdown and other sites. This report forms the basis of Bowie & Davidson 1955.)

Bowie, S. H. U. & Davidson, C. F. 1955. The radioactivity of the Piltdown fossils. In: Further contributions to the solution of the Piltdown problem / J. S. Weiner *et al.* *Bulletin of the British Museum (Natural History), Geology*, **2** (6), 276–282. (Radiometric assays were undertaken on 34 samples of bone and teeth from Piltdown, Sheffield Park (Piltdown II), and Barcombe Mills (Piltdown III), together with comparative material from other parts of the UK, and from Europe, North Africa, Asia and South America. The results are presented in a detailed tabulation.)

Bowie, S. H. U. (see also under Anon. 1954c)

Bowler, P. J. 1986. *Theories of human evolution: a century of debate, 1844–1944*. Baltimore: Johns Hopkins University Press, 1987, 336 pp.

Bowler, P. J. 1987. [Review of Charles Blinderman's *The Piltdown Inquest*.] *Isis*, **78** (3), 459. (Following a brief review of Blinderman's book, the writer feels disposed to remark that 'I have spent the last several years of my life studying theories of human evolution in the late nineteenth and early twentieth centuries, and it makes me angry to see the amount of effort that has been frittered away on this trivial whodunit.'))

Bowler, P. J. 1990. Digging the dirt. *Times Higher Education Supplement*, 5 Oct, 18. (Reaction to Spencer 1990a, which prompted a response from Saunders 1990. Cited in Turrin 2006.)

Bowler, P. J. 1991. Book review: *Piltdown: A Scientific Forgery*, by F. Spencer. *Annals of Science*, **48** (4), 405–406. (Not seen)

Bowler, P. J. 1992 (contribution to discussion in Tobias 1992c: considers that the case presented by Tobias against Arthur Keith 'is as circumstantial as the cases that have been built against other parties.' Since Keith's 'theoretical position predicted the discovery of anatomically modern humans as far back as the Pliocene', then 'to plant an ape jaw and then spend the rest of your life trying to minimize its ape characters seems counterproductive to me. If Keith was a villain, he was a remarkably incompetent one when measured against his own hypothesis on human origins. He would have been better off without the jaw... Tobias's claim that Keith's guilt explains his hostility to the discovery of *Australopithecus* is a case of putting the cart a long way before the horse. Europeans had a deep-seated cultural preference for Central Asia as the source of human origins... Hardly anyone would have taken an African discovery seriously in the 1920s, even without Piltdown...' The issue of cultural prejudice in defining man's origins is discussed in Bowler 1986. See also Osborn 1920 for an American view on human origins.)

Boylan, P. J. 1979. The controversy of the Moulin-Quignon jaw: the role of Hugh Falconer. In: *Images of the earth: essays in the history of environmental sciences* / edited by L. J. Jordanova & R. S. Porter. Chalfont St. Giles: British Society for the History of Science (BSHS Monograph no. 1), pp. 171–199. (In 1863 the workmen of Jacques Boucher de Perthes, an amateur French geologist, discovered the remains of a human jaw together with stone tools of supposedly early Palaeolithic age, at Moulin-Quignon, a few miles east of Abbeville. British archaeologists were sceptical, believing that the workmen had manufactured the tools. The jaw was later proven to be recent (Oakley 1980a). For a neat summary of the affair see Spencer 1990a, 223 n. 6. A short discussion, with additional modern references, will be found in Turrin 2006, 11.)

Boylan, P. J. 2004. Museum specimens as sacred objects: the contrasting treatment of the Piltdown fraud of 1912 and that of Moulin Quignon, 1863. In: *Geofakes, frauds and hoaxes*, abstracts of a meeting organised by the History of Geology Group, under the aegis of the Geological Society of London, Burlington House, London, 22 October 2004, p. 5. ('Since the first exposure of the enormity of the Piltdown Man forgery fifty years ago, both scientific and popular literature has focused almost exclusively on attempts to unmask the forger. However, there is a much more fundamental question that ought to be asked: how could such a crude forgery be accepted by so many of the scientific community in the first place and then escape serious review, let alone detection, for a further 40 years? ...The very uncomfortable conclusion is that the rapid development of museum curatorship concepts between 1893 and 1912 created an atmosphere in which the Piltdown 'finds' were never seriously regarded as scientific objects requiring dispassionate investigation. Instead, they were treated more as sacred relics, not to be defiled by proper scientific investigation or evaluation, while international politics, or at least prestige, were also in play. We need to constantly ask ourselves, as scientists, whether we are today being just as gullible in the face of contemporary scientific frauds or myths.')

Brannigan, A. 1981. *The social basis of scientific discoveries*. Cambridge: Cambridge University Press, xi, 212 pp. (Piltdown Man, pp. 133–142)

Breuil, H. 1922. In: *Revue anthropologique*, July-Aug, p. 229. (Argues that the so-called worked bone implement from Piltdown is the result of gnawing by beaver or *Trogontherium*, beaver remains having been reported from the same bed. Not seen)

Breuil, H. 1938. The use of bone implements in the Old Palaeolithic period. *Antiquity*, **12**, no. 45, 56–67, plates I–IV. (Translation from the French of a paper read at the International Congress of Prehistoric and Protohistoric Science at Oslo, 1936. Breuil once again dismisses the Piltdown bone implement as the work of a large species of beaver, p. 59.)

Breuil, H. 1949. Silex taillés de Piltdown (Sussex). *Bulletin de la Société préhistorique Française*, **46**, 344–348. (Not seen)

Bristow, C. R. 1964. Ordnance Survey National Grid Series six-inch map, TQ42SW (NW quarter), with ms. geological lines and hand-colouring. British Geological Survey, Keyworth, geologists' field-slip collection, NGDC/FC/21955. (Revision geological mapping undertaken by C. R. Bristow for incorporation into geological one-inch series England and Wales sheet 303, Tunbridge Wells, published in 1971. This field-slip is centred on Sheffield Park.)

Bristow, C. R. 1964. Ordnance Survey National Grid Series six-inch map, TQ42SW (SE quarter), with ms. geological lines and hand-colouring. British Geological Survey, Keyworth, geologists' field-slip collection, NGDC/FC/21958. (Revision geological mapping undertaken by C. R. Bristow for incorporation into geological one-inch series England and Wales sheet 319, Lewes, published in 1979. This field-slip is centred on Barkham Manor. The gravel deposit around Barkham, classified as Third Terrace, is depicted somewhat differently to Edmunds 1925. The field-slip is dated Aug 1964.)

British Geological Survey (see Geological Survey of Great Britain for details of geological maps; see also under names of following Geological Survey officers, whose roles in the context of Piltdown are indicated: Bowie (radioactivity of Piltdown assemblage), Bristow (geological mapping, 1964), Bromehead (fluorine in groundwater), Davidson (radioactivity of Piltdown assemblage), Edmunds (geological mapping, 1925), Lake *et al.* (Lewes memoir, 1987), Newton (Tertiary man), Reid (Pleistocene geology), Rhodes (photographer), Topley (Weald memoir), Strahan (Geological Survey Director & President of Geological Society), White (Lewes memoir, 1926), Whitaker (Ipswich Man), Worssam (river terraces); F. J. Bennett wrote on eoliths in a non-official capacity; C. P. Chatwin, one of the suspects in the Piltdown forgery, joined the Geological Survey sometime after the Piltdown discoveries; K. P. Oakley briefly worked for the Survey during the War period, where he was introduced to geological aspects of fluorine in groundwater.)

Broad, W. & Wade, N. 1982. *Betrayers of the truth*. New York: Simon & Schuster, 256 pp. (The motives that lead to fraud and deceit in science are examined, and notable examples cited. Scientists consider themselves to be the principal arbiters of truth and objectivity—yet this is demonstrably a self-deception. The often-made claim that scientific research proceeds in a rational way is likewise shown to be a myth. 'Expectancy leads to self-deception, and self-deception leads to the propensity to be deceived by others. The great scientific hoaxes, such as the Beringer case and the Piltdown man...demonstrate the extremes of gullibility to which some scientists may be led by their desire to believe.' The Piltdown 'dawn man' emerged at a time of British national pride when the Empire was at its height, and was thus eagerly embraced as proof that England had been the cradle of world civilisation.)

Broek, A. J. P. van den 1921. Onze tegenwoordige kennis van den voor-historischen mensch. *Tijdschrift van het K. Nederlandsch Aardrijkskundig Genootschap*, ser. 2, **38**, 355–389. (Adopts Boule's attribution of the Piltdown jaw to *Troglodytes dawsoni*, pp. 370–71, 374)

Bromehead, C. E. N. (see Eastwood & Oakley 1953)

Bronowski, T. 1951. *The common sense of science*. London: William Heinemann, 154 pp. (Cited in Tobias 1992c, who notes that, as Bronowski and others have pointed out, 'the assumption of truthfulness in science is the very *leitmotif*, almost the religion, of the scientist. We may think our colleagues have been mistaken, foolish, ignorant, ill-advised, pig-headed or simple-minded, but the very last thing we tend to suspect them of is dishonesty.')

Brook, A. 2004. Piltdown and Sussex: an uneasy relationship. In: *Geofakes, frauds and hoaxes*, abstracts of a meeting organised by the History of Geology Group, under the aegis of the Geological Society of London, Burlington House, London, 22 October 2004, pp. 5–6. (An examination of the *Sussex County Magazine*, published 1926–1956, reveals a number of previously unnoticed papers connected with the Piltdown finds (Martin 1943; Kenward 1955). By contrast, the Sussex Archaeological Society were dismissive of Dawson and disregarded the whole Piltdown controversy, although an intriguing notice has been discovered in the Society's Newsletter of April 1980: see Holden 1980a.)

Brook, A. 2014. Sir Arthur Smith Woodward: mystery surrounding his 'burial' solved. *Sussex Past & Present*, no. 132 (Apr), 10–11. (Smith Woodward died at his Sussex home, Hill Place, Balcombe Road, Haywards Heath on 2 September 1944. According to his entry in the *Oxford Dictionary of National Biography*, 2004, vol. 60, 231–33, he was buried in the churchyard of All Saints Church, Lindfield, Sussex, a village just to the northeast of Haywards Heath. In fact, although his memorial service was held there, he

had been cremated a week earlier (6 Sept) at Brighton Crematorium, and his ashes scattered in the Garden of Remembrance.)

Brooks, K. 2001. Dinosaur quarries of Hastings. *Hastings & District Geological Society Journal*, **17**, (Dec), 7–13. (The two most important local fossil hunters in Sussex in the latter part of the 19th and early 20th centuries were Samuel Husband Beckles and Charles Dawson. The Dawson Collection at the Natural History Museum contains some of the very best dinosaurs ever found in Sussex. Dawson found specimens that were identified as three new species of *Iguanodon* (Lydekker 1888a, 1889). One of these, *Iguanodon dawsoni*, is now recognised as belonging to two species, *Barilium dawsoni* and *Hypselospinus fittoni* (Norman 2010). *Iguanodon hollingtoniensis* has also been assigned to *Hypselospinus*. The writer has attempted to identify the quarry locations from which these specimens came.)

Broom, R. 1918. The evidence afforded by the Boskop skull of a new species of primitive man (*Homo capensis*). *Anthropological Papers of the American Museum of Natural History*, **23** (2), 63–79. (Comparison with Piltdown, p. 78)

Broom, R. 1933. *The coming of man, was it accident or design?* London: H. F. & G. Witherby, 238 pp. (*Eoanthropus dawsoni*, pp. 153–156. Includes a restored profile of the Piltdown skull (Fig. 27) modified after Smith Woodward. The author notes how closely the arrangement of structures round the large nerve opening at the back of the jaw resembles that of the chimpanzee. ‘The affinities of the Piltdown skull are very uncertain. There is no other known type the least like it. It is probably an early type of man evolved from an *Australopithecus*-like ancestor which prematurely specialised in a large brain. It is most unlikely that any of the later types of man have been descended from *Eoanthropus*.’)

Broom, R. 1950. Summary of a note on the Piltdown skulls. *Advancement of Science*, **6**, no. 24, 344. (Draws attention to the existence of parts of a third fossil human skull found by Dawson at Barcombe Mills, which the writer examined at the Natural History Museum in the spring of 1949. This had not previously been described, but consists of a large frontal bone, two malar bones and a slightly worn molar. He also had scarcely any doubt in asserting that the Piltdown jaw and skull are from the same individual. A manuscript 5-page report was deposited by Broom with the NHM and is partly reproduced in Spencer 1990b, 187–8. A summary of these findings was read by K. P. Oakley to the British Association at Newcastle on 5 Sept 1949.)

Broom, R. & Schepers, G. W. H. 1946. The South African fossil ape-men: the Australopithecinae. *Transvaal Museum Memoir*, no. 2, 272 pp, 5 plates; reprinted AMS Press, New York, 1978. (Tobias 1992c has emphasised ‘the interrelationship between the history of Piltdown acceptance and Taung rejection.’ He states that ‘Keith’s authoritative acceptance of Piltdown and his equally authoritative rejection of *Australopithecus* were largely responsible for delaying the world’s acceptance of the Taung child and of all those other australopithecines that came later from Sterkfontein, Kromdraai, Makapansgat, and Swartkrans, as early members of the Hominidae, although Keith recanted (1947) after he had received Broom’s and Schepers’s (1946) monograph on the South African Australopithecinae.’ See comments under Keith 1948)

Broom, R. (for a biography see Findlay 1972; see also Tobias 2001)

Bumüller, J. 1925. *Die Urzeit des Menschen*. 4th ed. Augsburg, 353 pp, 27 plates. (*Eoanthropus*, pp. 266–271, etc, plates XIX, XXII & XXIII. Cited in Quenstedt 1936)

Burkitt, M. C. 1921. *Prehistory: a study of early cultures in Europe and the Mediterranean basin*. London: Cambridge University Press, 438 pp. (Piltdown Man, pp. 178–181)

Burkitt, M. C. 1944. Obituaries: Mr. J. Reid Moir, F.R.S. *Nature*, **153** (25 Mar), 368–369.

Burkitt, M. C. 1955. Obituaries of the Piltdown remains. *Nature*, **175** (2 Apr), 569. (A review of Weiner *et al.* 1955, ‘Further Contributions to the Solution of the Piltdown Problem’, and Weiner’s *Piltdown Forgery*. The reviewer recalls as a young man being permitted to handle the original Piltdown specimens in Smith Woodward’s room at the Natural History Museum, shortly after they had been presented at the Geological Society meeting in December 1912. He admits that it would never have occurred to him to question their authenticity.)

Busk, G. 1861. On the crania of the most ancient races of man. By Professor D. Schaaffhausen, of Bonn. *Natural History Review*, **1** (2), 155–176, plates IV–V. (A translation and commentary on Schaaffhausen 1858 in which he describes the human remains from Neanderthal and compares them with those from Engis)

Busk, G. 1865. On a very ancient human cranium from Gibraltar. *Report of the British Association for the Advancement of Science*, Bath, 1864, 91–92. (The now celebrated Gibraltar skull, discovered by Lieutenant Edmund Flint in March 1848 during the construction of a fortification called Forbes' Barrier, was not subjected to scientific scrutiny until 1862, when the palaeontologists George Busk and Hugh Falconer visited the island. The similarity of the cranium to that from the Neanderthal cave was appreciated, and comparison was also made 'with the Tasmanian, and with certain tribes of Western Australia, which are usually distinguished by the great comparative lowness of skull, which was considerably less than the breadth.' See Keith 1911a concerning the original circumstances of the discovery. For a modern review see Stringer 2000.)

Buttel-Reepen, H. B. von 1913. *Man and his forerunners, incorporating accounts of recent discoveries in Suffolk and Sussex*. London: Longmans, Green and Co, x, 96 pp. (Translated from the German *Aus dem Werdegang der Menschheit* (1911) by A. G. Thacker, who was responsible for the addition of material relating to the Piltdown find. Thacker had been able to examine the Piltdown specimens personally. See Translator's note, pp. vi–vii; 'The Sussex find', pp. 66–69 & frontispiece (Woodward's reconstruction); 'Plan of the origin and dispersal of human races and apes according to Klaatsch's theory, with the addition of *Eoanthropus*', Fig. 51, p. 73 & pp. 74–75. Thacker tentatively places *Eoanthropus dawsoni* with the Neanderthal race, Second Interglacial Phase; while *Homo heidelbergensis* is placed in the First Glacial Phase, Table III, p. 26. For a review, probably by Arthur Keith, see Anon. 1913h.)

Butterfield, W. R. (William Ruskin Butterfield, 1872–1935, was in 1972 accused by Guy van Esbroeck of being the Piltdown forger aided by Venus Hargreaves, the farm labourer at Barkham Manor. See discussions in Spencer 1990a, 165–7, and Turrittin 2006, 29. For an obituary see Belt 1935)

Cameron, J. A. 1919. A contribution to the evolution and morphology of the human skull, including a comparative study of the crania of certain fossil Hominidae. *Proceedings and Transactions of the Royal Society of Canada*, ser. 3, **12**, sect. 4, 149–183. (Makes frequent reference to *Eoanthropus*, including figs 2, 5–8, 10 & 11)

Campbell, B. G. 1991. The Piltdown forgery: pursuit of the perpetrator. *Current Anthropology*, **32**, 217–218. (A review of Frank Spencer's *Piltdown: A Scientific Forgery* and *The Piltdown Papers*, published in 1990. Spencer 'presents a brilliantly researched and compelling case against the distinguished British anatomist and anthropologist Sir Arthur Keith... The revelation is astonishing in many ways, and though it does not fit all the evidence perfectly it is almost convincing... It seems to me, however, that in a court of law an effective defence could quash the case against Keith.')

Carreck, J. N. 1973. Obituary notices: Alvan Theophilus Marston. *Proceedings of the Geologists' Association*, **84** (1), 118–120. (Died 14 Jan 1971)

Chamberlain, A. P. 1968. The Piltdown 'forgery'. *New Scientist*, **40** (28 Nov), 516. (Correspondent's father was Dawson's cousin who never believed that Dawson had time enough from his other duties to be either a good archaeologist or a competent forger. A response to Rosen 1968.)

Chamberlain, A. T. 1992 (contribution to discussion in Tobias 1992c: The writer suspects 'that both Spencer and Tobias have overstated the value of the circumstantial evidence that makes up the bulk of the case against Keith.' He goes on to counter several of Tobias's claims.)

Chatwin, C. P. (In 1975 K. P. Oakley revealed to Prof Vernon Reynolds his conviction that the Piltdown 'hoax' had involved C. P. Chatwin and Martin Hinton, both of whom at the time were working under Smith Woodward at the Natural History Museum. See Miles, H. 2003. The first mention of Chatwin as a suspect in the published literature seems to be the account of Matthews, L. H. 1981. Andrew L. Morrison, archivist at the British Geological Survey (Chatwin had been a former employee of the Survey), contacted Prof Reynolds in November 2011 to ascertain the truth of the report. He confirmed the correctness of the details reported by Miles as supplied by him, and in an email of 7 Nov went on to state that 'Kenneth Oakley told us (my wife and I) once, when we visited him while he was a sick man in Oxford, not long before he died, that he was leaving behind among his possessions an audio tape on which he had recorded the full details of who was behind the Piltdown hoax and what parts they played. I tried to track down this tape after his death, I recall being in touch with his son, but alas there was no trace of it. Perhaps it was thrown away when Kenneth's flat was cleared. Probably no-one knew it was valuable.')

Chipper (Chipper, a goose, was an ever-threatening presence around the Manor at Barkham, as appears from a number of photographs. Several writers have implicated Chipper in the forgery, presumably in jest, but ostensibly on account of the goose's ferocious diversionary tactics: see Saunders 1990, Kennedy 1991, 310, Crisler 2011.)

Chippindale, C. 1990. Piltdown: who dunit? Who cares? *Science*, **250** (23 Nov), 1162–1163. (Commentary on Frank Spencer's case against Arthur Keith, in which the writer deprecates 'yet more raking of old gravel', and considers that the continuing interest in the pursuit of the Piltdown forger(s) is more akin to a parlour game than an attempt to contribute to intellectual history.)

Chippindale, C. 1992 (contribution to discussion in Tobias 1992c: 'Here is the trouble with the Piltdown industry: in part, it has been the imagination of amateur sleuths [mostly qualified scientists!] playing at "Piltdown: Who Mighta Dunit?"' The scenarios they enjoy constructing are accusations of fraud, and this is why I am uncomfortable with watching the game.' The writer finds no decisive proof in the Langham/Spencer/Tobias case against Keith.)

Clapp, G. W. 1925. *The life and work of James Leon Williams, Doctor of Dental Surgery, Licentiate of Dental Surgery, Royal College of Surgeons of Ireland, Fellow of the Royal Anthropological Institute of Great Britain and Ireland, Fellow of the New York Academy of Science.* New York: The Dental Digest, 299 pp. (The writer also published an obituary in 1932: James Leon Williams, D.D.S., L.D.S., F.A.C.D., F.R.A.I., in *Journal of Dental Research*, **12** (6), 876–884.)

Claringbull, G. F. & Hey, M. H. 1954. The results of X-ray crystallography tests. *Proceedings of the Geological Society of London*, no. 1514 (15 Sept), cxv–cxvi. (Report of a presentation made at a meeting on 2 June 1954 demonstrating the results of new investigative techniques applied to the Piltdown assemblage. In order to account for the presence of gypsum in many of the Piltdown bones, a sample of water from the well at the 'Piltdown Man' inn was analysed by Dr Roy C. Hoather, and samples of gravel and loam from the Piltdown site by Dr C. Bloomfield, both of which yielded notably low values of sulphate. See Beer 1954)

Claringbull, G. F. & Hey, M. H. 1955. The X-ray crystallography of the Piltdown fossils. In: Further contributions to the solution of the Piltdown problem / J. Weiner *et al.* *Bulletin of the British Museum (Natural History), Geology*, **2** (6), 268–270, plate 31. (Formal report of the presentation made in 1954)

Claringbull, G. F. (see also under Anon. 1954c)

Clark, W. E. Le Gros (see under Le Gros Clark, W. E.)

Clarke, E. V. (Ernest V. Clarke had been on friendly terms with Charles Dawson and in 1954 was interviewed by J. S. Weiner. He considered that Dawson had perpetrated a 'bit of sharp practice' when he acquired Castle Lodge, Lewes. On a visit he had been taken into Dawson's cellar to view several pieces of bone, whereupon Dawson's wife had said something to the effect that she did not know what secrets were hidden there, as she was kept in the dark. See Spencer 1990b, 239–40.)

Clemens, W. A. 1963. Wealden mammalian fossils. *Palaeontology*, **6** (1), 55–69. (Includes a reassessment of *Plagiaulax dawsoni* Woodward 1892, which is here described as being of doubtful affinity. All that now remains is a fragment of the root of the molar tooth, the crown having been lost since it was last described by Simpson in 1928. The root, as now revealed, contains only a single pulp cavity, which 'strongly suggests that it is not the tooth of a mammal', pp. 55–56. Of the two so-called *Plagiaulax*-like teeth described by Woodward in 1911, one tooth, M10481, is referable to *Loxaulax valdensis*, which was found by Teilhard de Chardin; the other, M20241, has a crown which is so badly decayed that it cannot definitely be assigned as mammalian, pp. 57–58.)

Clements, J. 1982. Piltdown revisited. *Popular Archaeology*, **3** (May), 30–31. (Not seen. Prompted a reaction from Joel 1982)

Clements, J. 1997a. Piltdown man again. *Current Archaeology*, **13** (7), no. 151, 277. (A summary of excavations conducted in the Hastings area since '1858' which could have provided Dawson with his Piltdown skull. The correspondent is a member of the Hastings Museum Association which Dawson co-founded. A longer version of this account appears under Clements 1997b. A report of these suggestions featured in *The Times*: see Hammond, N. 1997. Farrant 2013, 185 n. 121, has been unable to substantiate the writer's claim that Dawson acted for Thomas Ross's executors and thereby inherited some of his collection of skulls from the East Cliff cemetery, concerning which see Lavers 1995.)

Clements, J. 1997b. Reviewing Piltdown: the Hastings connection. *Hastings Area Archaeological Research Group Journal*, new ser, no. 4 (Dec), 8–10. (A rather rambling account in which the author suggests that various excavations in the Hastings area from 1856 onward could have provided Dawson with a number of

opportunities to acquire human skulls. Thus, two thick skulls were uncovered in June 1912 by the Borough Engineer in connection with drainage works near a railway station. These 'apparently disappeared...and it would have been quite easy for Dawson to spirit them away, given his eminence and association with Hastings Museum.')

Clermont, N. 1992. On the Piltdown joker and accomplice: a French connection? *Current Anthropology*, **33** (5), 587. (A comment on Tobias's defence of Teilhard de Chardin (*ibid.*, **33**, 244), in which the writer quotes a letter from Teilhard which he interprets as providing evidence of Teilhard's knowledge of the existence of the Piltdown canine, 13 months before he was to find it! He also implicates Boule. Clermont's reading of this letter has been dismissed by Walsh (1996, 147–8). As example, he makes the grave error of thinking that Teilhard was present at the finding of the Piltdown jaw. There was also some correspondence from Francis Thackeray under this heading.)

Clinch, G. 1905. Early man. In: *The Victoria history of the county of Sussex. Volume I*, edited by W. Page, 309–332. (Description and illustration of a piece of fossil red deer antler pierced by a square hole, which Charles Dawson claimed was an ancient hammer found at Bulverhythe, pp. 327–328 & plate facing p. 318. The modern view, as expressed by Russell 2003, 86–89, is that the hole has been cut with a steel knife in a way comparable to the Piltdown 'cricket bat'. Clinch also lists and illustrates (pp. 327, 330 and facing plate) some objects from a Bronze Age hoard that was found at St Leonards on Sea and became part of the Dawson Loan Collection at Hastings Museum, over which hang the usual question marks, Russell 2003, 89–93. A description of the Lavant Caves (pp. 326–327) excavated in 1893 by Dawson and Lewis, includes a plan drawn by Lewis (plate facing p. 326). See also McCann 1981.)

Coates, J. I. [c.1956]. The deplorable history of Piltdown Man. *Survey, University of Nottingham*, **3** (1), 18–34. (A well informed review)

Cockburn, A. 1970. A skull for scandal. *Sunday Times Magazine*, 8 Mar, 30–34. (A well-written and well-informed overview which got the compiler of the present *Select Bibliography* hooked on the subject of Piltdown and led in 1971 to his first attempt at identifying published references, aided by his appointment in June of that year to a position in the library at the Geological Survey, then at South Kensington, London. The author notes that the Piltdown Man pub is said to have changed its name from the Lamb in the early 1950s, and at the time of writing the sign depicted 'an unshaven brute in an orange pelt throwing rocks at a beast with two horns.' The pub reverted to its former name in 2011.)

Cockburn, C. 1954. Truth is stranger than Piltdown. *Punch*, no. 227 (1 Dec), 687–689. (Article prompted by the well-publicised statements of John Manwaring Baines regarding the Dawson collection at Hastings Museum. Respecting Dawson's motives for fraud, the writer thinks that 'the probability, according to people who know what the form was on and around the South Downs in that eagerly forward-looking period of small-town life, is that he did it because his nature abhorred a vacuum. When he saw a demand he filled it... Being a prosperous solicitor was well enough, but what were wanted, too, in provincial England at that period...were pundits on this and that, who got the neighbourhood and neighbours a good name for progress, awareness, and keen cultured interests. All-round men, not academic, but in the broad swim... He was vigilant, too, in the interests of the Borough of Hastings, and once wrote them a letter warning them to be on their guard against buying forged Old Masters. He wrote down for their guidance a method of using a pin to scratch at the canvass and tell how old the paint was. What with his History of the Castle and then Piltdown Man, he was a busy, happy man, who made everyone in the area feel happier and happier all the time... Said the writer of his obituary... "Mr Dawson was a most versatile student, and during his last illness was investigating a development of incipient horns in a cart-horse." ...When Piltdown Man blew up under modern methods of examination the people at the pub named after him were very much distressed. But an old man in the public bar of the "Piltdown Man" was recorded as expressing satisfaction. "I always said it was a sheep," he said. Mr. Mainwaring Baines is also a little disturbed by the extent of the hoax now discovered. "It makes one wonder," he says broodingly, "whether, perhaps..." "You mean," I said, "whether perhaps... I mean there are others... everywhere?" Mr. Baines shrugged gloomily.')

Cohen, C. & Hublin, J.-J. 1989. *Boucher de Perthes, 1788–1868: les origines romantiques de la préhistoire*. Paris: Éditions Belin, 271 pp.

Colbert, E. H. 1975. William King Gregory, May 19, 1876–December 29, 1970. *Biographical Memoirs, National Academy of Sciences*, **46**, 91–133.

Cole, H. de Vere (see commentary under Daniel, G. 1974)

Cole, J. 2013. Reviews: *The Piltdown Man Hoax: case closed*, Miles Russell. *Current Archaeology*, no. 280 (July), 45. (A brief review which includes the following useful statement: ‘The author importantly offers insight into why Dawson embarked on such a massive campaign of forgery production, which was ironically seated in a desperate desire for fame and academic respect. The subject matter of this book is hugely engaging, and the ideas and evidence presented quite captivating. There is a noticeable lack of copy editing that sadly detracts from the good research and presented arguments, however.’)

Cole, S. M. 1955. *Counterfeit*. London: John Murray, 209 pp. (The Piltdown puzzle, pp. 136–167. Also discusses the infamous Glozel finds, mentioned by Teilhard in a letter to Oakley (Spencer 1990b, 212), and the Calaveras skull. For an excellent account of the Glozel forgery, exposed in France in the late 1920s, see A. Vayson de Pradenne, The Glozel forgeries, *Antiquity*, **4**, no. 14, June 1930, 201–222, translated from the French by O. G. S. Crawford.)

Cole, S. M. 1975. *Leakey’s luck: the life of Louis Seymour Bazett Leakey, 1903–1972*. London: Collins, 448 pp. (Leakey’s views concerning Teilhard de Chardin’s supposed complicity in the Piltdown ‘hoax’, pp. 374–375, 399. Cole believes that Leakey had no real evidence against Teilhard, only a hunch: ‘Teilhard had once told him that Dawson, the main suspect, was not responsible, but had refused to elaborate.’)

Cole, S. M. (see also under Daniel 1982b)

Combridge, J. H. 1977a. Ashburnham clock dial and Maresfield sketch-map. *Sussex Archaeological Society Newsletter*, no. 22 (Aug), 121. (Short note concerning the writer’s examination of the ‘Ashburnham clock dial’, the details of which appear in Combridge 1977b. The dial-plate came from a genuine 30-hour wall timepiece-with-alarum which had originally been made, or at least sold, around 1820 by the clocksmith Thomas Beeching of Ashburnham. Early in the 20th century it was provided with engraved scenes closely related to the illustrations and text of Charles Dawson’s Sussex iron work paper (1903). The writer believes that Dawson’s collaborator, John Lewis of Maresfield, designed the scenes, which may have been engraved by W. J. Lewis Abbott. ‘There need not have been any fraudulent intent in the designing or engraving of the scenes but the possibility of a hoax cannot be excluded.’ Furthermore, there are stylistic links between the clock-dial scenes, published drawings by Lewis, and the ‘Maresfield Forge’ map that appears in Crake 1912.)

Combridge, J. H. 1977b. BEECHING/Ashburnham: a Georgian dial with Edwardian scenic engravings. *Antiquarian Horology*, **10** (4), 428–438. (These scenic engravings of Wealden iron-making are believed to be the work of John Lewis and appear to be a crude attempt to achieve a 17th-century style, evidently done for Charles Dawson. See remarks under Combridge 1977a. The dial is discussed by Russell 2003, 144–148, who notes that ‘Dawson himself does not appear to have ever commented on the artefact, either privately or in print. After his death in 1916, the clock dial was sold at auction...’)

Combridge, J. H. 1981. Charles Dawson and John Lewis. *Antiquity*, **55** (Nov), no. 214, 220–222. (Adds further evidence to that presented by Heal 1980, and includes a lengthy discussion of the Maresfield Forge map supposedly fabricated by Dawson and described by Andrews, but here shown to be the work probably of John Lewis. Suggests the possible involvement of Lewis in the Piltdown forgery and provides a few biographical details.)

Cooke, J. 1915. *Discussion on the Piltdown skull*. Oil painting purportedly based on a much publicised meeting which took place at the Royal College of Surgeons on 11 Aug 1913; it now hangs at the Geological Society in Burlington House, Piccadilly, London. (This picture was exhibited at the Royal Academy in May 1915, following a private showing in the artist’s studio on 23–25 March. The subject (see frontispiece to this *Bibliography*) may have been inspired by a more informal discussion that took place at the RCS in July 1913, which is recorded by Keith (1950, 326). A report of the August meeting appeared in *The Times* (Anon. 1913f). The picture attracted considerable notice and was engraved and published in a limited edition signed by the artist (Spencer 1990b, 113). A feature entitled ‘Scientists discussing Piltdown skull’ appeared in the *Illustrated London News*, **146**, 672. A notice in *Nature*, **95**, 13 May, 297, states that the painting ‘forms a memento of a discussion on the Piltdown skull which was held in the conservator’s room at the Royal College of Surgeons in June, 1913’, and further remarks that ‘Prof. Elliot Smith stands behind on [Keith’s] right pointing to the disputed middle line of the cranium.’ The original was purchased from the artist by Dr C. T. Trechmann, F.G.S., for £25, and presented to the Geological Society in 1932; see notice in *Abstracts of Proceedings of the Geological Society of London*, no. 1251, 6 July 1932, 111; for further information see Spencer 1990b, 77, 113, 125, 126. Cooke also supplied an ‘imaginary portrait’ of the head of Piltdown Man which appears in Smith Woodward’s *The Earliest Englishman*, 1948, and is reproduced as a tailpiece at the end of this *Bibliography*.)

Coon, C. S. (Carleton Stevens Coon, 1904–1981, was an American physical anthropologist at the University of Pennsylvania. He examined the Piltdown remains at the Natural History Museum in 1951 and became suspicious that the molar teeth had been artificially abraded, but was reticent to mention his observations without further reflection. See Oakley 1979b.)

Cooper, C. F. 1945. Arthur Smith Woodward, 1864–1944. *Obituary Notices of Fellows of the Royal Society*, **5**, no. 14, 79–112, plate. (The significance of Piltdown in Woodward's life is somewhat underplayed in this brief biography, almost two thirds of which is a record of his publications. We are however told that 'In his own research work he employed a method which he once explained to the writer of this notice. He did not like to hurry matters but preferred to keep the specimen or specimens on which he was working lying in view in his room so that he could turn to them from time to time in the intervals of his routine work and "let their message soak in." Very precious specimens, however, such as the fragments of the Piltdown Skull were kept in a locked drawer to be taken out on occasions and pondered over.' In his retirement one of his pleasures 'was often a drive in his car to inspect the site of the discovery of the Piltdown Skull...')

Cooper, J. 1993. Frogs alive. *New Scientist*, **138** (8 May), 50. (The Booth Museum of Natural History at Brighton possesses Charles Dawson's 'toad in the hole', a hollow flint nodule containing a mummified toad, said to have been discovered by two workmen from Lewes. It was described by Dawson in the 1901 Annual Report of the Brighton & Hove Natural History and Philosophical Society. See Russell 2003, 126–128.)

Costello, P. 1981a. Teilhard and the Piltdown hoax. *Antiquity*, **55** (Mar), no. 213, 58–59. (Presents evidence refuting Gould's claim of a conspiracy between Teilhard de Chardin and Dawson. See also editorial by Glyn Daniel in this issue, *ibid.*, 2–4.)

Costello, P. 1981b. Piltdown puzzle. *New Scientist*, **91** (14 Sep), 823. (The correspondent, who is writing a book about the Piltdown affair, points out many factual defects in Harrison Matthew's entertaining and colourful version of events at Piltdown, recently serialised in the *New Scientist*. The case against Teilhard de Chardin is shown to be seriously flawed.)

Costello, P. 1985. The Piltdown hoax reconsidered. *Antiquity*, **59**, no. 227 (Nov), 167–173, plates XXX–XXXII. (Accuses Dawson's friend, the Uckfield analytical chemist, Samuel Allinson Woodhead, of being the Piltdown hoaxer. A prefatory note by Glyn Daniel, the journal editor, describes the paper as a resume of Costello's forthcoming book 'setting out his complete investigation into the mystery, and coming to what we believe is the proper and final solution.' This book has never been published (Costello 1989). Costello's defence of Dawson brings forth some useful new information concerning the circumstances under which Castle Lodge was purchased. Costello also obtained confirmation of the 'coconut' story from the daughter of Alfred Thorpe, the labourer who discovered the skull at Barkham Manor. In explanation of how the skull might have come to be there, he learned from a local resident that the adjacent field is called Church Field, and found evidence that medieval plague victims had been buried 'on the common' (on this point see Garner-Howe 1997b). He also reproduces (Plate XXXII) part of an OS six-inch map held by the Sussex Archaeological Society, on which Smith Woodward has indicated the field, just south of Sheffield Park, where he believed Piltdown II had been found. A signed annotation reads: 'P is the field from the sweepings of which in 1915 I suppose the remains of the second Piltdown Skull were obtained by Charles Dawson.' Costello's case against Woodhead is based on a distorted reading of letters written by Woodhead's two sons, one of which puts Dawson in a suspicious light, yet is interpreted by Costello in a completely opposite sense! See Spencer 1990b for transcripts of the earlier letters, together with comments.)

Costello, P. 1986. The Piltdown hoax: beyond the Hewitt connection. *Antiquity*, **60**, no. 229 (July), 145–147. (While Costello finds himself easily convinced of Prof. John Hewitt's involvement in the Piltdown fraud, based on the recollections of Elizabeth Pryce (Daniel 1986), the editor, Glyn Daniel, admits that Dr Garry Moss, who has undertaken some historical research and knows about the suggested connection between Hewitt and the Piltdown skull, has not turned up any firm evidence to support it. Costello suggests that Hewitt sourced the orangutan jaw from one of his contacts at Imperial College or Cambridge. Cambridge physical anthropologists such as Haddon and Duckworth had well-known connections with Borneo. 'Dr Jack Trevor, a Cambridge anthropologist of a later generation at the Duckworth Laboratory, had his interest in Piltdown sparked off by a rumour that Duckworth was involved in the hoax (Papers: Cambridge University Library).' Costello concludes: 'One thing is certain at least, Charles Dawson was innocent.')

Costello, P. 1987 (see Doyle & Costello 1987)

Costello, P. 1989. *The missing link: the strange story of the Piltdown Man*. Unpublished typescript. (There is also an earlier version dated 1985. Copies of both typescripts were supplied to John Farrant of the Sussex Archaeological Society and were utilised in his very thorough study of Charles Dawson's career prior to the Piltdown fraud. See Farrant 2013, 180, Note 4)

Costello, P. 1990a. Piltdown: the forger pinned down. *Sunday Times*, 7 Oct, 3.8. (A response to the assertions of Spencer 1990a implicating Arthur Keith in the Piltdown forgery. From Turrinin 2006)

Costello, P. 1990b. Piltdown plot. *New Scientist*, **128** (20 Oct), 59. (A criticism of Frank Spencer's case against Arthur Keith. The writer, who boldly claims to speak 'from a position of authority on the Piltdown fraud', repeats his own case against Woodhead and Hewitt. An editorial cartoon by Austin is included, with the words 'There's a lot of inbreeding up on Piltdown'.)

Cox, D. R. 1983. Piltdown debate: not so elementary. *Science* **83**, **4** (9) Nov, 21–22. (A response to Winslow & Meyer 1983, drawing attention to misconceptions and omissions in their characterisation of Conan Doyle)

Craddock, P. 2009. *Scientific investigation of copies, fakes and forgeries*. Oxford: Butterworth-Heinemann (Elsevier), 640 pp. (Ch. 19: Scientific fraud and Charles Dawson, pp. 471–496. Largely drawn from published sources and including reference to other scientific frauds. Specific case studies include *Archaeoraptor* 'the Piltdown bird' (China), the Beauport Park figurine (Dawson), and the Pevensey inscribed bricks (Dawson). With respect to the sourcing of the Piltdown mammalian assemblage, it is noted that the high level of radioactivity found in the teeth of the Pliocene elephant *Elephas planifrons*, which was matched with examples from Tunisia, can now also be matched with examples from Malta and India (information from Andy Current, NHM, 26/11/03). The radiocarbon ages derived for the Piltdown jaw and cranial fragments are presented and discussed in detail (pp.491–3). In ascertaining the perpetrator at Piltdown, the writer notes that 'The reasons for continuing to suspect that Dawson did not act alone are that the material evidence was too sophisticated for Dawson to have assembled by himself and that the whole fraud was too complex. However, considered examination of the material quickly showed that it had been crudely manipulated. Furthermore, the assemblage of stones and bones made no sense at all either as a group, or as being found in the late Pleistocene acidic gravels of the river Ouse in the vicinity of Piltdown.' Craddock speculates that Dawson may have been trying to emulate an earlier Lewes worthy, Gideon Mantell.)

Craddock, P. & Lang, J. 2004. Charles Dawson and the earliest cast iron: his 100% fake record maintained intact! *HMS News, Historical Metallurgy Society*, **58**, 3–4. (See Craddock & Lang 2005 for details)

Craddock, P. & Lang, J. 2005. Charles Dawson's cast-iron statuette: the authentication of iron antiquities and possible coal-smelting of iron in Roman Britain. *Historical Metallurgy*, **39** (1), 32–44. (Scientific examination of Charles Dawson's iron statuette and another small figure found more recently at the same Roman iron smelting site at Beauport Park, Sussex, has shown both to be of coal- or coke-smelted grey cast iron. The sulphur and manganese contents of the Dawson statuette strongly suggest that it is Victorian, and not Roman as stated by him. It had also been treated with potassium dichromate, as were the finds from Piltdown, thereby linking the actual forgery process firmly with Dawson. The other figure is more complex but still relatively recent.)

Craddock, P. (see also Jones, M. *et al.* 1990)

Crake, W. V. 1912. A notice of Maresfield Forge in 1608. *Sussex Archaeological Collections*, **55**, 278–283. (The article is accompanied by a small map bearing the caption 'Copy of a map of the Maresfield Forge in 1724 / Made by C. Dawson, F.S.A.' Yet the article itself makes no mention of a map and is written as if unillustrated. The map is now known to be a fake (Andrews 1974), and Russell 2003 has suggested that it was possibly concocted by John Lewis and the editor, Louis Salzman, to expose Dawson as a fraud, though its subtle message appears to have gone unnoticed. What W. V. Crake thought about the editorial insertion of this map into his paper, or whether he was complicit in it, is not recorded. Russell, p. 258, states that 'The 1912 edition of *Sussex Archaeological Collections*, containing the offending plan of the Maresfield Forge, came out in the spring of 1913, a mere three months after the Piltdown discoveries had officially been announced to the world.' He suggests that the map, which includes 'Pilt Down', was a last minute addition to an existing article, 'hence its incompatibility and lack of clear association with the published text'.)

Crawford, O. G. S. 1956. Editorial notes: the exposure of the Piltdown fraud. *Antiquity*, **30** (Mar), no. 117, 1–2. ('The exposure of the Piltdown fraud has been welcomed by two very different groups of people. Human palaeontologists are glad to be rid of objects that were inconsistent with each other and with a large range of securely established facts; and those who, from envy, hatred, malice, uncharitableness, or just plain ignorance, rejoice to see 'experts' discomfited...' None of the experts were archaeologists, apart from

Dawson, 'and his claims were very thin.' The writer was himself present when the Piltdown discovery was announced at the Geological Society on 18 Dec 1912.)

Cremona, M. A. & Thompson, R. L. 1993. *Forbidden archeology: the hidden history of the human race*. San Diego: Bhaktivedanta Institute, xxxviii, 914 pp. (Ch. 8: The Piltdown showdown, pp. 501–525. These authors have an anti-evolution agenda and claim that modern humans have existed for millions of years, while mainstream science has suppressed the evidence by the application of a knowledge filter founded on evolutionary 'prejudices' about human origins and antiquity. Not seen.)

Crisler, V. 2011. The Piltdown mystery. <http://venerable.files.wordpress.com/2010/09/piltdown-mystery.pdf> (An entertaining examination into the failings of scientific methodology and the influence of confirmation bias in scientific thinking. After reviewing and dismissing the cases against Doyle, Teilhard and Keith, the writer suggests a new suspect in the shape of 'Chipper' the goose. 'There is a picture of him standing in the midst of the men working at the Piltdown site, and he seemed of a surly disposition.' Moreover, the case against Chipper 'is proven for the simple reason that nobody has been able to rule the goose out as chief suspect.' On the other hand, the case against Dawson, which is reviewed at some length, is deemed to be overwhelming.)

Currant, A. 1996 (see Gardiner & Current 1996)

Currant, A. 2004a (see Taggart 2004)

Currant, A. 2004b. [Book review]: Piltdown Man: the Secret Life of Charles Dawson & the World's Greatest Archaeological Hoax, by Miles Russell. *British Archaeology*, no. 76 (May), 38. ('...Russell has brought together all the evidence one could ever need to confirm that Charles Dawson...was in fact a thoroughgoing rogue of the highest order. Piltdown appears to have been the glorious tip to an iceberg of deception, with some 33 cases of scientific fraud now proven against Dawson and many others still pending... For me at least, this puts Piltdown to bed once and for all... It would be good to think that this was the last word on Piltdown Man. I somehow doubt whether we will be so lucky!' Andy Currant is Curator of Fossil Mammals at the Natural History Museum. It should be noted that less than half of the 33 cases examined by Russell can be said to represent fraud on Dawson's part, and fewer still are 'proven'.)

Dale, W. (contribution to discussions in Dawson & Woodward 1914b, & Woodward 1917b, in the latter of which he expresses the opinion that the 'hammer-stone' found by Woodward is of much younger date than the main Piltdown assemblage because it is 'scarcely patinated at all'.)

Daniel, G. 1955. Reading and writing. *Archaeological News Letter*, 5 (10) Mar, 196–198. (This is a review or commentary on Weiner 1955b. Cited in Turrill 2006)

Daniel, G. 1972. Editorial: [comments on *The Piltdown Men*, by Ronald Millar.] *Antiquity*, 46 (Dec), no. 184, 262–264. (Daniel considers that this book, while very readable, is hastily put together and contains many errors. Millar is unable to find any reason why Elliot Smith should have committed the forgery, yet 'Somehow the whole affair reeks of Smith.' To which Daniel replies 'Stuff and nonsense!' After discussing Millar's treatment of the eolithic controversy, Daniel quotes a story of his own describing a confrontation between W. J. Sollas and Sir Ray Lankester: 'Sollas, small and sarcastic, had exclaimed: "I ask any impartial person, 'To what possible human use could that lump of road-metal be put?"' And Lankester, grim and gigantic, having picked the thing up in his huge fist, had replied, "Well, I could kill you with it..."')

Daniel, G. 1974. Perpetrator of the Piltdown forgery. *The Times*, 18 April, 15. (Takes issue with the confident assertion of Howard 1974 that the damning evidence provided by the Maresfield map and Pevensey brick-stamp necessarily proves Dawson's complicity in the Piltdown forgery. 'There are many who have been suspected of being the Piltdown forger. My list, apart from Dawson, includes Sir Arthur Smith Woodward, Professor W. J. Sollas, Horace de Vere Cole, Lewis Abbott, Father Teilhard de Chardin, Sir Grafton Elliot Smith, A. S. Kennard, W. H. Butterfield and Martin Hinton.' He expresses the hope that a second revised edition of Weiner's *The Piltdown Forgery* will answer many outstanding questions arising from the Piltdown affair. Unfortunately Weiner never completed his revision; see Harrison, G. A. 1983. The inclusion of Horace de Vere Cole in Daniel's list of suspects was no doubt meant in jest. Cole (1881–1936) was an outrageous practical joker whose most famous hoax was perpetrated in 1910 (see his entry in Oxford DNB). At best, Cole's antics might have given encouragement to the real Piltdown forger. See reaction from Weiner 1974.)

Daniel, G. 1975. Editorial [on Leakey, Piltdown, and Teilhard]. *Antiquity*, 49 (Sept), no. 195, 165–169. (Recounts Leakey's suspicions about Teilhard de Chardin's complicity in the Piltdown affair following the exposure of the fraud in 1953. Leakey evidently believed that Teilhard had initially played a practical joke

on Dawson, but that the two had then developed the hoax together to test how far the pundits could be taken in. In 1972 Leakey was engaged in completing a book in which he set out these theories and discussed them with Glyn Daniel in conversations and letters (some of which are here quoted), but would not be swayed from his views.)

Daniel, G. 1979. Editorial. *Antiquity*, **53** (Mar), no. 207, 5. (Reaction to Halstead's accusation against W. J. Sollas)

Daniel, G. 1981. Editorial: [a defence of Teilhard against the accusations of Leakey and Gould.] *Antiquity*, **55** (Mar), no. 213, 2–4.

Daniel, G. 1982a. Editorial: [Kenneth Oakley and Piltdown.] *Antiquity*, **56** (Mar), no. 216, 7. (Oakley and the Editor had for the last ten years been in constant correspondence and conversation about the real facts of the Piltdown forgery. His last letter to the Editor, a few weeks before his death, was concerned with this in the light of accusations made by Harrison Matthews in 1981. A careful reading of Teilhard's letters had caused Oakley to re-think his earlier views about Teilhard's involvement in the Piltdown affair. See Daniel 1982b.)

Daniel, G. 1982b. Editorial: [Sonia Cole and Joseph Sidney Weiner.] *Antiquity*, **56** (Nov), no. 218, 164. (After briefly reviewing the careers of Sonia Cole and Joe Weiner, both of whom died this year, the editor records that 'On one thing Le Gros Clark, Weiner, Oakley, Sonia Cole, and the Editor of *Antiquity* were agreed: Teilhard de Chardin was not the Piltdown forger, and those like Louis Leakey and Stephen Gould who thought he was, were gravely mistaken...Teilhard was haunted all through his life by the sad suspicion which, we believe, in the end amounted to a certainty, that he had been duped by Charles Dawson, the man who he thought had befriended him. From those who knew him well we know that he did not like to discuss Piltdown. He would have liked it to be a closed book, but the Le Gros Clark, Weiner, Oakley debunking opened the book wide, and there was one page which troubled and haunted him to the grave: how was it that he found the canine? What diabolical machinations lay behind the events of Saturday, 30 August 1913?')

Daniel, G. 1985. Editorial. *Antiquity*, **59**, no. 227 (Nov), 165–166. (Prefatory note to Costello 1985, which identifies Samuel Woodhead as the Piltdown forger)

Daniel, G. 1986. Piltdown and Professor Hewitt. *Antiquity*, **60**, no. 228 (Mar), 59–60. (In response to wide-spread publicity and a BBC television broadcast in *Newsnight* on 22 Nov 1985, which followed Peter Costello's revelations in *Antiquity* no. 227, a letter was received from Mrs Elizabeth Pryce, in which she states that in about 1952/3 she was told by Prof. John Theodore Hewitt that he and a friend had made the Piltdown man as a joke. It appears that Hewitt and Woodhead (Costello 1985) were acquainted, and that the latter might thus have been the 'other' person.)

Daniel, G. (see also Johnstone 1957)

Dart, R. A. 1925. *Australopithecus africanus*: the man-ape of South Africa. *Nature*, **115** (7 Feb), 195–199. (Discovered in Nov 1924 in a limestone quarry six miles south-west of Taung (then usually called Taungs) railway station, just beyond the Transvaal border in Botswana. The find consisted of a juvenile skull found in a cave. There were no artefacts. The announcement prompted reactions from Duckworth 1925, Keith 1925b, Smith, G. E. 1925a, and Woodward 1925. See subsequent correspondence from Arthur Keith 1925c, who objected to the inference made by Dart that the Taung skull, *Australopithecus*, represented the 'missing-link' between man and ape.)

Darwin, C. 1859. *On the origin of species by means of natural selection, or, the preservation of favoured races in the struggle for life*. London: John Murray, ix, 502, 32 pp, 1 plate. (As Oakley 1964 has pointed out, 'The appearance of Darwin's *Origin of Species* in 1859 dramatically focused attention on the whole problem of the origin of living things including man himself. In his autobiography Darwin has recorded that already in the year 1837 or 1838, when he first became convinced that species were mutable productions, he could not avoid the belief that man must come under the same general law.' Yet Darwin carefully refrained from discussing man's origin in this work, except to note in a single line in the final pages of the book that 'light will be thrown on the origin of man and his history.' This passing note was nevertheless sufficient to cause a storm of controversy, contradicting as it did the story of man's origin in the Book of Genesis.)

Darwin, C. 1871. *The descent of man, and selection in relation to sex*. London: John Murray, 2 vols. (In this bold and heretical work, Darwin tackled the dangerous topic of mankind's origin, daring to suggest that human beings were descended from an 'ape-like progenitor'. If true, there should be some evidence in the fossil record to support such an argument. Thus began the search for the 'missing link', an ape-man. A satirical London magazine, *The Hornet*, published a caricature of Darwin in its issue of 22 March 1871,

entitled 'A venerable orang-outang: a contribution to unnatural history.' Darwin's thesis had to some extent been anticipated by the work of his able supporter, T. H. Huxley 1863, in which year Charles Lyell also published his *The Geological Evidences of the Antiquity of Man*. Both works owed much to Darwin's *Origin of Species* of 1859.)

Davenport-Hines, R. 2004. Dawson, Sir (Arthur) Trevor, first baronet (1866–1931). In: *Oxford dictionary of national biography*. Oxford: University Press, vol. 15, 572–573. (Charles Dawson's younger and more successful brother was an armaments manufacturer. He was described in 1904, by the then secretary of state for war, as a 'clever but somewhat slippery gentleman' and could be unscrupulous in his business dealings. At his death his estate was worth £257,589.)

Davidson, C. F. (see under: Anon. 1954c; Bowie & Davidson 1954a, 1954b, 1955)

Davies, H. N. 1904. The discovery of human remains under the stalagmite-floor of Gough's Cavern, Cheddar. *Quarterly Journal of the Geological Society of London*, **60** (3), 335–348, plate XXIX. (In his correspondence with Smith Woodward, Dawson mentions Cheddar Man on more than one occasion, notably in a letter dated 30 June 1912, where he refers to the jaw of the Cheddar specimen, from which Weiner (1955, 89) surmised that the Piltdown jaw had already been discovered and was in Woodward's possession (Spencer 1990b, 24–25, 96). Davies considered the Cheddar specimen to be of Palaeolithic age. It has been suggested that the loss of the articulating condyle of the lower jaw in this specimen might have provided the Piltdown forger with a helpful precedent.)

Dawkins, W. B. 1880. *Early man in Britain and his place in the Tertiary period*. London: Macmillan & Co, xxiv, 537 pp. (The author regards the reputed evidence of Pliocene man in France (Denise) and Italy (Olmo and Tuscany) as unsatisfactory, pp. 90–93. Likewise he considers the presence of man in early Pleistocene strata as doubtful, pp. 133–134. The subject of eoliths is not discussed, and indeed the concept of an Eolithic or Dawn Stone Age was not to be introduced until 1883: see Mortillet 1883.)

Dawkins, W. B. 1912 (contribution to discussion in Dawson & Woodward 1912, in which he accepts the association of the Piltdown skull and jaw, concluding that *Eoanthropus* is 'a missing link between man and the higher apes, appearing...in the Pleistocene age.' He considers the Pliocene fossils, *Mastodon* etc, to have been derived from older strata unconnected with the human bones.)

Dawkins, W. B. 1913a (contribution to discussion in Dawson & Woodward 1913b: In response to Keith's suggestion of a Pliocene age for the Piltdown deposit, he wished to state only that 'It was clearly proved to be later than the Pliocene by the presence of an antler of red deer (*Cervus elaphus*), a species unknown in the Pliocene of Europe, and abundant in the Pleistocene and later strata. He agreed with the Authors of the paper in their conclusion that the deposit belongs to an early stage of the Pleistocene Epoch.')

Dawkins, W. B. 1913b. [Discussion of differences between Woodward and Keith respecting the restoration and antiquity of the Piltdown skull]. *Morning Post*, 23 Dec. (Boyd Dawkins' letter was prompted by an anonymous article that appeared in the *Morning Post* on 18 Dec reporting on the reading at the Geological Society of a paper by Dawson & Woodward (1913b) entitled 'Supplementary note on the discovery of a Palaeolithic human skull and mandible at Piltdown.' The article had been written by Keith (Spencer 1990a, 242 n. 63), and not unexpectedly focused on the difference of opinion over whether the skull was of Pliocene or Pleistocene age. The anonymous article and Dawkins' response are quoted at length in Spencer 1990a, 79–80. Dawkins probably knew or suspected that Keith was the author of the provocative article. His letter prompted reactions from Abbott 1914 and Moir 1914.)

Dawkins, W. B. 1914. The Missing Link. *Manchester Guardian*, 12 Jan. (Report of a public lecture at the Manchester University Museum, at which Piltdown was discussed and eoliths were denounced. Not seen)

Dawkins, W. B. 1915. The geological evidence in Britain as to the antiquity of man. *Geological Magazine*, dec. 6, **2** (10), 470–472. (An attack on eoliths and on the concept of Pliocene man as espoused by Moir and Lankester in East Anglia. With regard to *Eoanthropus dawsoni*, 'the missing link between primitive man and the higher apes,' he fully accepts Smith Woodward's opinion that the find belongs to the early Pleistocene period. The evidence of the implements and mammalian remains at Piltdown is somewhat equivocal as to age. 'It must also be noted that the intermediate characters of the Piltdown skull and lower jaw point rather to the Pliocene than the Pleistocene stage of evolution. We must, in my opinion, wait for further evidence before the exact horizon can be ascertained.')

Dawkins, W. B. (William Boyd Dawkins, 1837–1929, was the first professor of geology at Owens College (subsequently University of Manchester) from 1874 to 1908. Arthur Smith Woodward studied geology and

palaeontology under him from 1880 to 1882. Dawkins remained Woodward's principal mentor during his years at the Natural History Museum and was among the first to be informed of the Piltdown discoveries; see for example his letter to Woodward dated 6 Oct 1912, cited in Spencer 1990b, 26. Dawkins was a fierce opponent of the eolithic movement. For an obituary see Woodward 1931.)

Dawson, A. T. (one of Charles Dawson's younger brothers. See Davenport-Hines 2004, Towler 1953)

Dawson, C. 1893a. A tooth impregnated with phosphate of iron. *Abstracts of Papers, Brighton and Sussex Natural History and Philosophical Society*, for year ending June 1893, 14–16. (Dawson exhibited this tooth to the Society on 11 Jan 1893. The specimen, obtained from a Brighton jeweller, was a calf's tooth artificially coloured and polished, ready for cutting by the trade as turquoise. Dawson had attempted to imitate the process. Cited in Farrant 2013, Appendix 2.)

Dawson, C. 1893b. The Minnis Rock. *Hastings and St. Leonards Observer*, 18 Feb, 6. (In this carefully researched account Dawson argues against the antiquity of the Black Arches and Minnis Rock recesses at East Hill, Hastings as claimed in a paper by G. B. Gattie in *Sussex Archaeological Collections*, **38**, 129–36 (1892). A review which subsequently appeared in the 'Notes and queries' section of *SAC*, **39**, 222–3 (1894) was in full accord with Dawson's views and expressed the Society's regret at having published the misguided paper by Gattie.)

Dawson, C. 1893c. Interesting discovery near Goodwood: early British caves in the chalk. *West Sussex Gazette*, 2 Mar. (Farrant 2013, Appendix 2, describes this paper as 'An amended and reordered version of the report on the excavation of the Lavant caves, the discussion of their origin and the finds list, dated 19 Feb. 1893, which Dawson had sent to the Duke of Richmond, now West Sussex Record Office, Goodwood MS 1928.' See McCann 1981 for discussion and links to other published commentaries on the excavation. For other newspaper contributions by Dawson on the Lavant caves, not listed here, see Farrant *op. cit.*)

Dawson, C. 1893d (contribution to discussion on a mammalian incisor from the Wealden of Hastings: see Lydekker 1893, 283; Dawson's contribution to the discussion had appeared earlier in *Abstracts of the Proceedings of the Geological Society of London*, no. 605, 74–75; the paper was read 22 Mar 1893.)

Dawson, C. 1893e (exhibition of Beauport Park iron statuette at Society of Antiquaries on 18 May 1893: see Read 1893)

Dawson, C. 1894a. Neolithic flint weapon in a wooden haft. *Sussex Archaeological Collections*, **39**, 97–98, 1 plate. (The description and illustration of the implement in question is said to be based upon a drawing made by Stephen Blackmore, a shepherd of East Dean, near Eastbourne, who possessed a fine collection of flint implements, some of which Dawson had been engaged to purchase on behalf of Hastings Museum. It appears that Blackmore had found the implement, along with several others (illustrated), in digging a trench above a cliff at Mitchdean, East Dean. Exceptionally, the implement lay in a wooden haft, now completely carbonised, which 'crumbled at the touch, and all attempts to save it proved futile.' However, 'Mr. Blackmore is fortunately a fair draughtsman and was able to make a drawing of this most interesting discovery.' While Evans 1897 was unconvinced by Dawson's interpretation, it was Veryan Heal (1980) who first questioned the authenticity of the find, noting that 'It is questionable whether Dawson's reconstruction would be of much practical use.' Russell (2003, 51–54) notes that neither the original drawing nor any of the implements illustrated in the accompanying plate have survived to the present day. He believes that the plate was probably the work of Dawson's frequent co-worker, John Lewis, but presents no convincing evidence to support the suggestion. See also remarks by Combridge 1981.)

Dawson, C. 1894b. Ancient boat found at Bexhill. *Sussex Archaeological Collections*, **39**, 161–163, 1 plate. (This rather doubtful-looking boat, seemingly transitional in form between prehistoric coracle and medieval clinker construction, was recovered from the seashore west of Bexhill after being revealed beneath shifting sand in the winter of 1887–88. It was removed in broken pieces and seems to have ended up outside a boat builder's workshop where it was noticed by Dawson a short time afterwards. With the assistance of the boat builder, Mr Jesse Young, Dawson attempted to re-create, or perhaps re-imagine, the original form of the boat, which he determined to be 9 feet long, 6 feet wide and 18 inches deep. He established that it had first been noticed by a coastguard 30 years earlier when briefly exposed following a storm. The coastguard had also found some bones, the skull of a small horse which he later sold, and the debris of an ancient forest bed. A record of the 1888 discovery and removal, not mentioned by Dawson and with differing details, had already appeared in *Sussex Archaeological Collections*, **36**, 252–253 (1888), being derived from a report found in the *Southern Weekly News* of 21 Jan 1888. Heal 1980, in consultation with a Dr John Hale, concluded that 'With so shallow a draught and sides at such an angle its capacity for open-water travel and rowing would be

minimal, and its length:beam ratio does not suggest manoeuvrability.’ As realised by Dawson its authenticity is thus questionable. See discussion in Russell 2003, 55–60.)

Dawson, C. 1896. Note on the seals of the barons and of the bailiffs of Hastings. *Sussex Archaeological Collections*, **40**, 261–264, 2 plates. (Read at the Society’s visit to Hastings, 10 Oct 1894. Photos of seals are credited to Dawson, who was clearly a very capable photographer.)

Dawson, C. 1897. Discovery of a large supply of “natural gas” at Waldron, Sussex. *Nature*, **57** (16 Dec), 150–151. (Preliminary report on a discovery of gas which occurred accidentally while boring for water in the parish of Waldron, Sussex. Dawson reports that ‘I have taken samples of the gas, and submitted it to the county analyst for East Sussex (Mr. S. A. Woodhead), and he informs me, although he has not yet completed his analysis, that the gas is probably derived from petroleum... I am making experiments with the gas, and examining the cores of the boring with a view to ascertain the source of the supply.’ See Dawson 1898c)

Dawson, C. 1898a. List of Wealden and Purbeck-Wealden fossils. *Abstracts of Papers, Brighton and Hove Natural History and Philosophical Society*, for year ending June 1898, 31–37; also issued separately.

Dawson, C. 1898b. Ancient and modern “dene holes” and their makers. *Geological Magazine*, dec. 4, **5** (7), 293–302, plate XI; also *Report and Transactions of the South-Eastern Union of Scientific Societies*, third annual congress, Croydon, June 1898, 34–46 (with discuss). (Some of Dawson’s conclusions, put forward as new, appear to have been lifted without acknowledgement from an earlier report on deneholes by the Essex Field Club. See Russell 2003, 108–111)

Dawson, C. 1898c. On the discovery of natural gas in East Sussex. *Quarterly Journal of the Geological Society of London*, **54** (3) Aug, 564–571. (This paper was followed by a note from J. T. Hewitt, pp. 572–573, who had made an independent analysis of the gas and come to a conclusion regarding the suitability of the gas for illumination which differed markedly from that of Dawson. In the discussion that followed the reading of these two papers, pp. 573–574, Hewitt insisted that the gas came from a layer of compressed vegetation and not, as stated by Dawson, from a deeper petroleum-bearing horizon. Hewitt was subsequently proven wrong, and Costello (1986) has argued that he harboured some resentment at having been ‘set right by a mere amateur dabbler, especially in the cocky manner of Charles Dawson.’ Hewitt thus becomes another candidate for Piltdown ‘hoaxer’. For some other published and unpublished material connected with this discovery see Farrant 2013, Appendix 2, under year 1898. See also Dawson 1899a.)

Dawson, C. 1899a. Petroleum in Sussex. *Abstracts of Papers, Brighton and Sussex Natural History and Philosophical Society*, for year ended June 1899, 10–14. (Read at an excursion of the Society to Heathfield, 11 June 1899. From Farrant 2013, Appendix 2.)

Dawson, C. 1899b. Remarks on the visit to the bell pits (or dene holes) at Brightling. *Abstracts of Papers, Brighton and Sussex Natural History and Philosophical Society*, for year ended June 1899, 15–17. (This visit took place on the same day as the Heathfield excursion reported under Dawson 1899a. From *ibid.*)

Dawson, C. 1901a. Discovery of a mummified toad in a flint nodule found at Lewes, Sussex. *Abstracts of Papers, Brighton and Sussex Natural History and Philosophical Society*, for year ended June 1901, 34–39; also exhibited at the Linnean Society on 18 April 1901 and figured in the *Illustrated London News* and *The Graphic*. (See Cooper, J. 1993; Russell 2003, 126–128; Vines 2003. There is nothing intrinsically wrong with this discovery, since there are many such records in the older literature of incarcerated toads and frogs. Thus a letter to the *Selborne Magazine*, published in April 1912, reported the discovery of several small toads ‘in solid Chalk’ at Ropley, Hampshire. Edward A. Martin replied by drawing attention to Dawson’s celebrated ‘Toad in the Hole’, which was then at the Booth Museum of Natural History, Brighton. He explains that ‘the toad had entered the cavity via a small aperture and became trapped as it grew’, *Selborne Magazine*, **23**, July 1912, 131–132. Farrant 2013, Appendix 2, lists four citations on Dawson’s mummified toad.)

Dawson, C. 1901b. The services of the barons of the Cinque Ports at the coronation of the kings and queens of England, and the presidency of Hastings Port. *Sussex Archaeological Collections*, **44**, 45–54, 2 plates.

Dawson, C. 1901c. Excursion to Heathfield and Brightling, Saturday, June 22nd, 1901. *Proceedings of the Geologists’ Association*, **17** (4), 171–175. (The principal themes of the field excursion were the natural gas discovery at Heathfield and the bell-pits working the Purbeck Limestone at Brightling. The remainder of the route was conducted by Mr Lewis, who took the party to examine an ancient earthwork, purposely defaced by a former owner, at Tottingworth.)

Dawson, C. 1902a. Note on the Hastings Corporation relics of coronations of the kings and queens of England. *Sussex Archaeological Collections*, **45**, 110–113.

Dawson, C. 1902b. The history of the Hermitage at Buxted. See Miles, P. 2007.

Dawson, C. 1903a. Sussex pottery: a new classification. *Antiquary*, **39** (Feb), 47–49. (Not seen)

Dawson, C. 1903b. Sussex iron work and pottery. *Sussex Archaeological Collections*, **46**, 1–62, 28 plates. (Including description of a cast iron statuette claimed by Dawson to be ‘the earliest known example of cast-iron, in Europe at least’, pp. 4–5 & plate 1, fig. 1. See C. H. Read 1893. This is now known to be of 19th century date. For other failings, questionable claims and demonstrations of plagiarism in Dawson’s article see Russell 2003. It is clear that large sections of text were lifted and cleverly reassembled from a Geological Survey memoir on *The Geology of the Weald* (1875) by W. Topley. Dawson also described a ‘transitional’ horseshoe, being a cross between the Roman ‘hippo-sandal’ and a modern horseshoe, pp. 23–24 & plate 6, fig. 10. Concerning the ‘Sussex Martyrs’ fireback illustrated in plate 8e, see Paine 2013. Farrant 2013, Appendix 2, provides details of a 24-page *Catalogue of ancient Sussex iron implements, ornaments and utensils* that was prepared for an exhibition in December 1901, which gave rise to the present paper.)

Dawson, C. 1903c. *Souvenir Normand: note sur le Château de Hastings*. Uckfield: Brooker & Son, 4 pp. (This appears to have been issued on the occasion of a visit from the society, Le Souvenir Normand, to unveil a plaque at the site of the Battle of Hastings, on 20 August 1903. From Farrant 2013, Appendix 2.)

Dawson, C. 1905. Old Sussex glass: its origin and decline. *Antiquary*, **41** (Jan), 8–11. (Not seen)

Dawson, C. 1907a. The Bayeux Tapestry in the hands of “restorers”, and how it fared. *Antiquary*, **43** (July), 253–258; *ibid.* (Aug), 288–292; also issued separately, with minor amendments, as *The “restorations” of the Bayeux Tapestry*. London: Elliot Stock, 14 pp. (This article was a by-product of Dawson’s research for his *History of Hastings Castle*. Farrant (2013, 173) states that ‘Unless he relied on publications in French, he had examined the tapestry closely, noticing that wool used for repairs in the 18th and 19th centuries had run into the linen and that the arrow killing King Harold in the eye [the attribution of this figure to Harold is, however, doubted by some] was added by Charles Stothard in his 1818 drawing and was sewn into the tapestry during a later restoration.’ Walsh (1996, 187) comments that ‘For many years this article was cited in tapestry literature as an important contribution, and since no study of its possible sources has yet been made, nothing can be ventured about its origins. It may in fact represent that extremely scarce commodity, original, undervived work by Dawson... Still, common sense counsels otherwise.’ See also Dawson 1909a, Hicks 2006)

Dawson, C. 1907b. Some inscribed bricks and tiles from the Roman *Castra* at Pevensey (Anderida?), Sussex. *Proceedings of the Society of Antiquaries of London*, ser. 2, **21**, 410–413 (with discuss). (On 11 April 1907, Dawson presented before the Society at least three stamped bricks from the Roman fort at Pevensey bearing the only known epigraphic evidence of the Emperor Honorius in England. Dawson claimed to have found two of them himself in 1902, while a third incomplete example had been discovered during excavations made under the direction of the Sussex Archaeological Society in 1906–07 (Salzmann 1908). These brick-stamps are now known to be modern forgeries: see Peacock 1973.)

Dawson, C. 1909a. The Bayeux Tapestry in the hands of the restorers: additional notes and corrections. *Antiquary*, **45** (Dec), 470. (Additions to Dawson 1907a.)

Dawson, C. 1909b [1910]. *History of Hastings Castle: the Castlery, Rape and Battle of Hastings, to which is added a history of the Collegiate Church within the Castle, and its Prebends*. London: Constable & Co, 2 volumes (folio), xiii, 580 pp, [15] plates, [27] folded sheets (vol. II. chronical of the Battle of Hastings). (Dawson has been accused of uncritically plagiarising the work of others in the compilation of this impressive production. He did, however, acknowledge it as a work of compilation, and his principal failing was perhaps in having described himself as author rather than as compiler. Farrant (2013, 172–6) after careful examination, has concluded that Dawson’s ‘acknowledgements in the preface must be deemed less than was due to those upon whose work he relied, including William Herbert’s.’ The work received an unfavourable review from Salzmann 1910; see also Baines 1954, Miles, P. 1993, Postlethwaite 1953. Farrant 2013, Appendix 2, states that the work was actually published on 11 July 1910. Its compilation must have required considerable effort on Dawson’s part.)

Dawson, C. 1911. The ‘red hills’ of the Essex marshes and ‘saltings’. *Antiquary*, **47** (4) Apr, 128–132. (Concerning these curious mounds, Dawson puts forward a ‘possible explanation which appears not to have been considered, and yet is the most obvious, in the light of comparison and deduction – namely these ‘Red Hills’ are ballast-hills, the result of pottery rubbish carried and discharged as ballast by ships sailing from

some one or more great pottery centres (probably distant) during a considerable period of time, the return cargoes being clay for use at the potteries.' Dawson's article prompted a response from the Red Hills Exploration Committee, which pointed out that the summary of evidence was 'largely a repetition of what has already appeared in the [Committee's] reports'; from Russell 2003, 120–121.)

Dawson, C. 1912. *On the persistence of a 13th dorsal vertebra in certain human races*. Manuscript and type-script drafts of an unpublished paper with photographs: Piltdown Archives, Palaeontology Library, Natural History Museum. (Dawson wrote to Smith Woodward on 12 May 1912 enclosing the draft of a paper on the unusual subject of the 13th thoracic vertebra, which he described as a 'new subject', and asked Woodward if he would introduce his findings to the Royal Society, since he was 'very anxious...to secure the priority to which I am entitled' (Spencer 1990b, 21–22; 1990a, 195). Dawson had visited the Hunterian Museum of the Royal College of Surgeons, 'where he detected this extra vertebra in the skeletons of an Arawak Indian, a Niva-Fu whale-hunter, a male and female Eskimo, and an ancient Egyptian. Dawson attributed this phenomenon to a common factor in the lives of these races: the canoe or kayak, and the constant manipulation of the hips to maintain equilibrium, necessitating an additional muscle attachment in this region.' (Millar 1972). Although rare in humans, the 13th thoracic vertebra is a feature normal in apes. Dawson's anxiety for early recognition might be related to the publication earlier that year of a work by the French anatomist A.-F. Le Double (Spencer 1990b, 22; Le Double 1912), which described this phenomenon. Dawson appears to have been proficient in French (e.g. Dawson 1903c), though his wife Hélène was of French birth and may have assisted him in this respect. Weiner (1955, 180) states that although Dawson never published anything, 'the newspapers (I am told) 'ran' it during or after the Piltdown days as the discovery of a new race by the discoverer of Piltdown.' Indeed, Dawson's 'discovery' was picked up by the *New York Times* in Jan 1914 (Anon. 1914b). See also Hawkes 1916. See discussion in Russell 2003, 133–5. Langham (in Spencer 1990a, 194–5) concocted a strange tale regarding Dawson's motive for working on the 13th thoracic vertebra, which can only be regarded as a flight of fancy.)

Dawson, C. 1913a. The Piltdown skull (*Eoanthropus dawsoni*). *Hastings and East Sussex Naturalist*, **2** (2), 73–82, plate 6 + folded section. (A personal account of how he came to discover the Piltdown material at Barkham Manor. Plate 6 shows Dawson and Woodward searching the gravels at Piltdown, c. July 1912.)

Dawson, C. 1913b. [Zinc-blende and pisolitic limonite from the Fairlight Clays, Hastings.] *Quarterly Journal of the Geological Society of London*, **69** (2) 29 July, xcvi–xcix. (Brief description of specimens exhibited at a meeting of the Society on 25 June. Dawson records the zinc sulphide as occurring in ironstone nodules containing plant remains, noting that 'zinc-blende is not known to occur at other horizons in the Weald, nor anywhere else in the South-East of England.' On 17 Dec Dawson exhibited further samples of zinc blende from the upper beds of the Purbeck formation at Netherfield, Sussex, reported in *Quarterly Journal*, **70** (1) Apr 1914, p. xiv.)

Dawson, C. 1913c. The Piltdown skull: explanation of the present situation. *Sussex Daily News*, 11 Aug. ('Statement by Mr. Dawson' based on an interview. Cited in Spencer 1990a, 68)

Dawson, C. 1915a. [Notice of a paper on eoliths, read at a joint meeting of the Prehistoric Society of East Anglia and the Royal Anthropological Institute, 23 Feb 1915.] *Lancet*, 13 Mar 1915. (Dawson's paper was entitled 'Sussex Ouse Valley Cultures', and was essentially an attack on eolithic theory. It was also reported in *Journal of the Royal Anthropological Institute*, 1915, **45**, 364. Dawson gave a novel demonstration of the manner in which 'eolithic' shapes could be produced by shaking or sitting on a bag of starch, by which means he was able to produce broken pieces showing typical 'eolithic' fracture. The paper was never published but the Natural History Museum holds a copy of Dawson's manuscript 'Notes from the Piltdown Lecture 23 Feby. 1915', pp. 2–6, in a bound exercise book (Spencer 1990a, 89–90, 219–20 n. 24). Dawson's experiments are reminiscent of those described in Moir 1912e, and he leans heavily on the work of Warren and others. He was no doubt also aware of an early practical demonstration of accidental 'eolithic' fracturing in flint based on the observations of Marcellin Boule at a cement works near Paris (Boule 1905), which had prompted some discussion in Britain at the time.)

Dawson, C. 1915b. [Prismatic fracture in starch and flint.] *Abstracts of the Proceedings of the Geological Society of London*, no. 973 (31 Mar), 81. (Notice to the effect that 'A series of specimens illustrating 'prismatic fracture' in starch and flint, and its bearing on the form of flint-implements, was exhibited by Charles Dawson, F.S.A., F.G.S.' at a meeting of the Society on 24 Mar.)

Dawson, C. 1915c. The Piltdown skull (*Eoanthropus dawsoni*). *Hastings and East Sussex Naturalist*, **2** (4), 182–184. (An update on the course of investigations to date, with a discussion on the canine, the capacity of *Eoanthropus* for articulate speech, and the recent finding of the bone implement.)

Dawson, C. & Lewis, J. 1896. Description of and remarks on the dungeon cells at Hastings Castle. *Sussex Archaeological Collections*, **40**, 222–235, 4 plates (1 folded). (Read at the Society's visit to the Castle on 10 Oct 1894, where Dawson and Lewis invited members to examine an extensive tunnel with chambers or 'dungeon cells' beneath the castle, the clearance and recording of which they had recently overseen. By far the oddest observation in this account relates to previously reported 'peculiar markings' or discoloration on the south wall of the 'main gallery' which were said to resemble 'two shadows of human bodies on the wall, falling side by side between the so-called staple holes.' The Rev. E. Marshall had drawn attention to this discoloration in 1877, a year before the tunnel was sealed to visitors, and had attributed it to an 'exudation' from the corpses of chained prisoners. This phenomenon was no longer visible when Dawson and Lewis reopened the tunnel in 1894. Luckily, Dawson himself had visited the tunnel in 1872, when he would have been about eight years old, and had such a clear memory of the 'striking and unmistakable' human forms that he was able to make a drawing of them, which appears as Diagram No. 6 in the paper. The significance of these shadow-markings is played down in the text, presumably at the insistence of Lewis. The carefully drawn plans which accompany the paper, together with their calligraphic labelling, are the work of Lewis. Photographs are by Dawson, though probably retouched. See Russell 2003, 41–48, for a full discussion. Dawson published notices in the *Hastings and St. Leonards Observer*, 18 Aug, and the *East Sussex News*, 12 Oct 1894; cited in Farrant 2013, Appendix 2.)

Dawson, C. & Woodward, A. S. 1912. On the discovery of a Palaeolithic human skull and mandible in a flint-bearing gravel overlying the Wealden (Hastings Beds) at Piltdown, Fletching (Sussex). *Abstracts of the Proceedings of the Geological Society of London*, no. 932 (28 Dec), 20–27. (Abstract of paper and full record of discussion, with contributions from Sir Ray Lankester, A. Keith, W. Boyd Dawkins, W. L. H. Duckworth, Clement Reid, D. Waterston, A. S. Kennard, R. A. Smith, and E. T. Newton; includes details of specimens exhibited. See Dawson & Woodward 1913a for full text of paper and reprint of discussion.)

Dawson, C. & Woodward, A. S. 1913a. On the discovery of a Palaeolithic human skull and mandible in a flint-bearing gravel overlying the Wealden (Hastings Beds) at Piltdown, Fletching (Sussex). *Quarterly Journal of the Geological Society of London*, **69** (1) issued 25 Apr, 117–151 (with discuss), plates XV–XXI (some folded). (Paper read before the Geological Society, 18 Dec 1912, at which the first formal announcement of the Piltdown findings was made. The human skull and accompanying ape-like jaw are referred to *Eoanthropus dawsoni*, gen. et sp. nov; with a 'Preliminary report on the cranial cast' by G. E. Smith, pp. 145–7. Among works cited by Dawson the following may be noted: Elsdon 1887, Mantell 1833, Topley 1875, Godwin-Austen 1851, Dixon 1878, Piette & Pilloy 1907.)

Dawson, C. & Woodward, A. S. 1913b. Supplementary note on the discovery of a Palaeolithic human skull and mandible at Piltdown (Sussex). *Abstracts of the Proceedings of the Geological Society of London*, no. 949 (31 Dec), 28–31. (Abstract of paper and full record of discussion, with contributions from A. Keith, W. J. Sollas, W. Boyd Dawkins, and A. S. Underwood; includes details of specimens exhibited. See Dawson & Woodward 1914a for full text of paper and reprint of discussion.)

Dawson, C. & Woodward, A. S. 1914a. Supplementary note on the discovery of a Palaeolithic human skull and mandible at Piltdown (Sussex). *Quarterly Journal of the Geological Society of London*, **70** (1) 25 Apr, 82–99 (with discuss), plates XIV–XV. (Paper read before the Geological Society, 17 Dec 1913; the principal new findings included some nasal bones and a lower canine tooth; with an appendix by G. E. Smith 'On the exact determination of the median plane of the Piltdown skull', pp. 93–97.)

Dawson, C. & Woodward, A. S. 1914b. On a bone implement from Piltdown (Sussex). *Abstracts of the Proceedings of the Geological Society of London*, no. 965 (10 Dec), 15–18. (Abstract of paper and full record of discussion, with contributions from G. F. Lawrence, W. Dale, Reginald Smith, E. A. Martin, A. S. Kennard, F. P. Mennell, and S. Hazzledine Warren. See Dawson & Woodward 1915 for full text of paper and reprint of discussion.)

Dawson, C. & Woodward, A. S. 1915. On a bone implement from Piltdown (Sussex). *Quarterly Journal of the Geological Society of London*, **71** (1) 17 Sept, 144–149 (with discuss), plate 14 (folded). (The strange 'implement' described here had evidently been carved from the limb-bone of an elephant. In the discussion that followed the reading of this paper, Reginald Smith of the British Museum stated that 'it would rank as by far the oldest undoubted work of man in bone...', but added that 'the possibility of the bone having been found and whittled in recent times must be considered.' He could not imagine 'any use for an implement that looked like part of a cricket-bat'.)

Dawson, C. (see also Keith 1913c, Seward 1913, Woodward 1911. For other papers by Dawson not listed here see Farrant 2013, app. 2. For obituaries and biographical accounts see: Keith 1916, Woodward 1916,

Wright, S. 2000, Spencer 2004, Farrant 2013. The Charles Dawson Collection, held by Hastings Museum and Art Gallery, consists of two boxes of documents, two boxes of finds and some larger objects. For a full list of contents see: <http://www.nationalarchives.gov.uk/a2a/records.aspx?cat=509-hasmg&cid=-1#-1> For a discussion of Dawson as a suspect in the Piltdown forgery see Turrill 2006, 16–18.)

Dawson, W. R. (ed.) 1938. *Sir Grafton Elliot Smith: a biographical record by his colleagues*. London: Jonathan Cape, 272 pp, 4 plates. (Ch. I: General biography, by W. R. Dawson, refers to Elliot Smith's examination of the Piltdown skull and visits to the site, pp. 59–60. Ch. VI: The Manchester period, by J. S. B. Stopford, briefly describes the excitement in the Department of Anatomy at University of Manchester where Smith was Professor of Anatomy at the time of the Piltdown discovery, p. 160. Full list of published works, pp. 219–253.)

Day, M. 1987. Who dunnit down at the gravel pit? *Nature*, **326** (5 Mar), 24–25. (A review of Blinderman's *The Piltdown Inquest*. Michael Day, Professor of the Division of Anatomy, United Medical and Dental Schools, London, gives credit to J. S. Weiner for realising that the explanation for the strange anatomy and the fluorine results had to be fraud. 'There is no doubt that the Piltdown forger was knowledgeable, skilful, cunning and fortunate. The gullibility of the scientists at the time seems likely to have been due not to stupidity but to a desire to see evidence for a theory that was so compelling and satisfying. The hoaxer could lead them on from find to find, confirming their best guesses every time and feeding their scientific vanity. We are never so vulnerable as when others are confirming our views.'))

De Mille, R. 1979. Of Piltdown Men and Don Juan forgeries—the surprising costs of scientific hoaxes. *Human Behavior*, **8** (Mar), 68–69.

De Vries, H. & Oakley, K. 1959. Radiocarbon dating of the Piltdown skull and jaw. *Nature*, **184** (25 July), 224–226. (Radiocarbon dating shows that the Piltdown jaw is of geologically recent age, at 500 ± 100 years, while the cranium of Piltdown I is found to be 620 ± 100 years. These dates were later confirmed by Vogel & Waterbolk 1964. But see Spencer & Stringer 1989.)

Dempster, W. J. 1996. Something up Dawson's sleeve? *Nature*, **382** (18 July), 202. (The writer is unimpressed by Gardiner's assertion, as summarised in Gee 1996, that Hinton was the Piltdown forger)

Dempster, W. J. 1997. Piltdown: the simple answer. *The Independent*, 27 Mar. (Response to a report on 21 March concerning a meeting of the Linnean Society (also reported by Barwick 1997) at which various theories were aired about the possible instigator of the Piltdown forgery. In regard to earlier accusations against Keith, he points out that Keith had mixed feelings from the beginning about the true nature of the Piltdown jaw. 'I was present that day in 1953 when Weiner and co descended on the Buckston Browne Research Farm with a "doctored" chimpanzee jaw bone. To my amazement, Arthur Keith gave in immediately. So why did he not respond like that in 1912? He was a young man then and very ambitious, whereas Smith Woodward was at the top of the scientific establishment...' The writer accuses Dawson, but seems to implicate Woodward also.)

Dennell, R. W. 1992 (contribution to discussion in Tobias 1992c: bemoans the fact that of the 20 and more persons suspected of complicity in the Piltdown forgery, not one of them is a woman!)

Dennell, R. W. 1994. 'Son of Piltdown Man Found At Boxgrove' / 'Forget Piltdown—We've Still Got the Oldest'. *Antiquity*, **68**, no. 260, 482–483. (The discovery in 1994 of the Sussex Boxgrove Man has led to expressions of nationalistic pride and press jingoism reminiscent of the Piltdown discoveries in 1912. 'The TV crews had a field day, and accorded Boxgrove Man the same degree of importance that Indian Jones ascribed to the Lost Arc... "The discovery is a triumph for British archaeology" proclaimed *The Independent* before settling into it's-great-to-be-British-mode... and "every Englishman may walk a little taller in the recognition that he is descended from such a striking creature"... Why are we and the public served such codswallop?... It is a sad reflection on journalism that sensationalism remains the main means of communication. Consequently, we have again been dished up a fake, however genuine this time the fossil might be.)

Dennell, R. W. 2001. From Sangiran to Olduvai, 1937–1960: the quest for "centres" of hominid origins in Asia and Africa. In: *Studying human origins: disciplinary history and epistemology* / edited by R. Corbey & W. Roebroeks. Amsterdam: Amsterdam university Press, pp. 45–66.

Dietrich, W. O. 1916. Neues vom Eoanthropus Dawsoni Smith-Woodward. *Naturwissenschaftliche Wochenschrift*, **31**, 714–715. (Seems doubtful about the claimed association between jaw and cranium)

Dietrich, W. O. 1917. Ein angeblicher Vormensch aus Südengland. *Unsere Welt*, **9**, 363–370. (The Piltdown finds)

DiPietro, F. 2004. *The Piltdown latitudes*. New York: iUniverse, xi, 201 pp. (It is unclear what connection this disturbingly funny and weirdly surreal novel has with the subject of Piltdown, unless it be in regard to the identity of the perpetrator of the novel's crime! It adds another meaning to the expression 'graveyard humour.' Not for the faint hearted, and should be read to the accompaniment of 'Graveyard' by the Butthole Surfers.)

Ditch, D. (Dorren Ditch was Dawson's dentist: see Anon. 1955b)

Dixon, A. F. 1917. Note on the fragment of the lower jaw from Piltdown, Sussex. *Nature*, **99** (12 July), 399. (Abstract of a paper read to the Royal Dublin Society, 26 June. Professor Dixon believes that the ape-like peculiarities of the Piltdown jaw have been over emphasised, and suggests comparison with that of a Melanesian islander.)

Dixon, F. 1878. *The geology of Sussex, or, the geology and fossils of the Tertiary and Cretaceous formations of Sussex* / by the late Frederick Dixon. New edition, revised and augmented by T. Rupert Jones. Brighton: William J. Smith, xxiv, 469 pp, [66] plates. (Ch. VI. Geological features of Brighton, Lewes, and Newhaven, pp. 98–117. These notes were evidently supplied by T. R. Jones from various published sources. The description of the gravel pits at Barcombe, derived from Mantell 1833, gives rise to the following unaccredited footnote on p. 110: 'These gravels, often containing the bones of Elephant &c., are regarded as having been deposited when the rivers of the Weald were probably greater, and certainly flowed at much higher levels, than at present.' See comments under Godwin-Austen.)

Dodson, E. O. 1981. Piltdown in letters. *Natural History*, **90**, (6), 16–21. (Defends Teilhard de Chardin against Gould's accusation of complicity in the Piltdown affair)

Dodson, E. O. 1981. Was Pierre Teilhard de Chardin a co-conspirator at Piltdown? *Teilhard Review*, **16**, 16–21. (Not seen)

Dommissie, G. F. 1992. More views on the Piltdown saga. *Adler Museum Bulletin*, **18** (2), 21–23. (A contribution to the discussion concerning the assertions of Tobias 1991, 1992b against Arthur Keith. See Tobias 1992d for reply.)

Douglas, J. A. (Professor Douglas, who died in 1978, made some ludicrous tape-recorded assertions about his predecessor W. J. Sollas, Professor of Geology at Oxford University, in consequence of which Sollas became implicated in both the Piltdown and Sherborne frauds. One suspects that Douglas may have harboured a grudge against Sollas, who un-obligingly retained his professorship to the age of 87 before yielding the Chair to Douglas. It seems incredible that anyone should have taken Douglas seriously, but see Halstead 1978.)

Downes, R. L. 1954. Charles Dawson. *The Times*, 23 Nov, 9. (In response to *The Times* feature concerning possible forged iron objects in the Dawson collection at Hastings Museum (Baines 1954), the writer states that 'As the person who originated the investigation of the four iron objects... may I be permitted to make the position clear? The [Beauport Park] statuette has been proved to be of grey cast-iron, and to be a miniature replica of a Roman statue. That is all that can be said with certainty. My suggestion of a recent and Continental origin is only one possible explanation... The other three iron objects are doubtful... We must wait for a complete review of the evidence of Mr. Dawson's activities, ranging from his honest and talented work to his undoubted deceptions, before passing any judgement on him or on such debatable specimens.')

Downes, R. L. 1956. *Charles Dawson on trial (a study in archaeology)*. Unpublished typescript and ms, Sussex Archaeological Society, Lewes, 2 folders (chapters 1–43, c.407 leaves) + appendix in separate folder (54 leaves) + folder of correspondence (more than 200 pp) + envelope containing many newspaper cuttings. (Robert Leslie Downes was a graduate student of the University of Birmingham who wrote a dissertation on the history of the English iron industry incorporating a study of Dawson's Beauport Park statuette. He initially believed it to be genuine until alerted in May 1954 to Dawson's link with the Piltdown fraud, which prompted him to undertake a detailed re-examination of both the statuette and other Dawson-related items. Some of his findings found a place in Weiner's *Piltdown Forgery*. Having supplied Weiner with a document that was intended as an appendix, though not so-used, he went on to prepare a more ambitious work for publication, but failed to find a publisher. Walsh (1996, 247) gives as reason the 'rather inept presentation in both writing and organization of the extensive materials.' Downes's initial findings were evidently poached by Baines (1954; and see reaction from Downes 1954). His unpublished papers were first utilised by Walsh 1996. Miles Russell discovered the Downes papers while completing the final stages of his own work (Russell, 2003, 7) but was nevertheless able to make extensive use of them.)

Doyle, A. C. [1912]. *The lost world: being an account of the recent amazing adventures of Professor George E. Challenger, Lord John Roxton, Professor Summerlee, and Mr. E. D. Malone of the "Daily Gazette."* London: Hodder and Stoughton, 320 pp, [8] plates. (First published serially in *The Strand Magazine*, April–Nov 1912, this much celebrated novel appeared in book form in the autumn of that year. Among other things it features a tribe of ape-men. Malone's first encounter with one of these creatures records it as having had 'a human face — or at least it was far more human than any monkey's that I have ever seen. It was long, whitish, and blotched with pimples, the nose flattened, and the lower jaw projecting, with a bristle of coarse whiskers round the chin. The eyes, which were under thick and heavy brows, were bestial and ferocious, and as it opened its mouth to snarl what sounded like a curse at me I observed that it had curved, sharp canine teeth.' Later, a bedraggled Roxton, having escaped capture by the creatures, pronounces them 'Ape-men — that's what they are — Missin' Links, and I wish they had stayed missin'. In 1983 Winslow & Meyer accused Conan Doyle of having perpetrated the Piltdown 'hoax'. The evidence, they say, is all to be found in the pages of *The Lost World*. See also Milner 1990, Anderson 1996, Highfield 1997, Gornall 2003. The first English edition of this work is freely available from the California Digital Library. The *Strand Magazine* serialisation was illustrated by Harry Rountree and included a startling image of Malone's later encounter with a fearsome ape-man: "I felt an intolerable pressure forcing my head back." These illustrations were not included in the book. The English edition did not depict the ape-men, but the U.S. edition (New York: George H. Doran Company, [6], 309 pp, [16] plates) contained additional illustrations by Joseph Clement Coll, including an image of Malone's first encounter with an ape-man, facing p. 190: 'I read hatred and menace in the evil eyes'.)

Doyle, A. C. (for a discussion of Conan Doyle as a suspect in the Piltdown forgery see Turrittin 2006, 18–19. The earliest suggestion that Doyle was involved was made by Watson 1954.)

Doyle, J. C. & Costello, P. 1987. The letter *Science* 83 refused to print. *Baker Street Miscellanea*, no. 49, 35–37. (This letter, from Dame Jean Conan Doyle, had been prompted by an article in the journal *Science* 83 by John Winslow, which accused her father, Sir Arthur Conan Doyle, of having perpetrated the 'hoax' at Piltdown. She dismisses the article as 'a piece of silly-season journalism, a mere frivolity.' Addressed originally to the editor of *Science* 83, it was never published until taken up by the present journal.)

Drawhorn, G. M. 1994. Piltdown: evidence of Smith-Woodward's complicity. Paper presented in a poster session of the American Association of Physical Anthropologists on 1 April 1994 and reproduced in full on Richard Harter's website, 9 pp. An abstract appeared in *American Journal of Physical Anthropology*, **37**, Supplement 18, 1994, 82; Turrittin 2006, 28–9, states that the presentation was actually made on 31 Mar, not on April Fool's Day. (A review of the excavational/curatorial histories of the source localities for a number of introduced elements in the Piltdown assemblage indicates that Woodward had both intimate knowledge of and access to all of the requisite specimens. A Dawson-Woodward nexus is made more plausible by their long association. Woodward's primary motivation may have been an effort to establish himself as the principal candidate for the coveted directorship of the natural History Museum. On this last point see remarks by G. G. Simpson in Gardiner 1987.)

Drawhorn, G. M. 1996. Piltdown. *Pacific Discovery*, **49** (4), 45. (A response to Anderson 1996)

Drennan, M. R. 1927. A contribution to the Piltdown problem. *Nature*, **120** (17 Dec), 874. (The writer, based in the Anatomy Department, University of Cape Town, presents reasons for a new estimate of the cranial capacity of the Piltdown skull)

Drew, P. E. (see Tobias 1994)

Dubois, E. 1894. *Pithecanthropus erectus: eine menschenähnliche Uebergangsform aus Java*. Batavia: Landesdruckerei, 39 pp, 2 plates. (Eugène Dubois believed that he had found the long sought after 'missing link' with his discovery in 1891 of an ape-like skullcap, a human-looking thighbone and two molar teeth on the banks of the Solo River in eastern Java, which he dated to the Pliocene. Yet doubts were soon expressed concerning the professed geological age and mutual relations of the finds. Some scientists considered the skullcap to belong to a giant gibbon, a view that Dubois himself appears at some stage to have entertained.)

Dubois, E. 1896. On *Pithecanthropus erectus*: a transitional form between man and the apes. *Scientific Transactions of the Royal Dublin Society*, ser. 2, **6** (1), 1–18. (In this English language account of the Java find, the author emphasises the great age of the bones and teeth in stating that 'Their colour is chocolate-brown; they are harder than marble, and very heavy.' E. T. Newton (1897) was likewise struck by the 'dark brown colour' of the Java bones. One may suppose that the Piltdown forger was similarly impressed.)

Duckworth, W. L. H. 1912a. *Prehistoric man*. Cambridge: Cambridge University Press, viii, 156 pp (Duckworth's views on human evolution were not dissimilar to those of Arthur Keith. Thus he declares that the simple linear story of evolution is incorrect, and that probably 'men of Galley Hill type preceded in point of time the men of the lower Neanderthal type.' Not seen. For his more detailed discussion of the Galley Hill skeleton see Duckworth 1913.)

Duckworth, W. L. H. 1912b (contribution to discussion in Dawson & Woodward 1912. Philip Tobias, in Spencer 1990a, ix–x, records conversations with Wynfrid Laurence Duckworth (1870–1956), a Cambridge anatomist and physical anthropologist, who claimed to have examined the Piltdown remains before the formal announcement in Dec 1912, and 'had spotted at once that the patina on the cranium and on the jaw differed. He had written volumes of unpublished observations and reflections on the Piltdown remains...' Costello 1986 has implicated Duckworth in the Piltdown fraud on the basis of a rumour at Cambridge; on this last point see Spencer 1990a, 232, n. 78)

Duckworth, W. L. H. 1913a. The problem of the Galley Hill skeleton. In: *Essays and studies presented to William Ridgeway* / edited by E. C. Quiggin. Cambridge: Cambridge University Press, pp. 458–473.

Duckworth, W. L. H. 1913b (see Anon. 1913f)

Duckworth, W. L. H. 1925. The fossil anthropoid ape from Taungs. *Nature*, **115** (14 Feb), 236. (Reaction to the announcement by Dart 1925 of his discovery of *Australopithecus*)

Durrenberger, E. 1965. More about Holmes and the Piltdown problem. *Baker Street Journal*, **15**, 28–31.

Eastwood, T. & Oakley, K. P. 1953. [Presentation of the Henry Stopes Memorial Medal to Dr. K. P. Oakley in recognition of his work on the prehistory of Man.] *Proceedings of the Geologists' Association*, **64** (1), 50–51. (At the Annual General Meeting of the Society on 7 Mar 1952, the President, Tom Eastwood of the Geological Survey, presented Oakley with a medal, noting among other things that 'In collaboration with the chemists of the Government Laboratory, you applied the fixation of fluorine in bones and teeth to the dating of the Swanscombe Skull, to the Galley Hill Skeleton—thus ending more than sixty years of controversy—and to the Piltdown Skull.' Oakley in reply, acknowledging those who had given him encouragement, added 'Nor do I forget...how much I owe to the stimulus of working for a time on the Geological Survey, and thereby coming into contact with you and your colleagues. Especially would I like to mention Mr. Bromehead, who, in the course of my work on rock-phosphates during the war, led me to take an interest in the geological aspects of fluorosis, which had an unexpected outcome; and Mr. Henry Dewey, who introduced me to the Swanscombe gravels.')

Edmunds, F. H. 1925. Ordnance Survey County Series six-inch map, Sussex 40NE (west half), with ms. geological lines and hand-colouring (confined to superficial deposits, or 'drift') and notes in red ink. British Geological Survey, Keyworth, geologists' field-slip collection, NGDC/FC/14256. (Edmunds has marked two trial pits on the N side of the hedge opposite the 'Piltdown pit'. These were probably the work of Smith Woodward, who states in *The Earliest Englishman* (1948, 13) that after Dawson's death he 'was able to open a series of pits along the other side of the hedge in a field adjacent to the original pit.' One of these pits is recorded in a Geological Survey photograph (Rhodes 1925a). The reverse side of the field-slip, which is signed and dated April 1925, includes a pencilled note on the Piltdown gravel. The geology of the Piltdown area, part of British Geological Survey 1:50 000 series England and Wales sheet 319 Lewes, was remapped by Bristow 1964.)

Edmunds, F. H. 1926 (see White 1926)

Edmunds, F. H. 1950. Note on the gravel deposit from which the Piltdown skull was obtained. *Abstracts of the Proceedings of the Geological Society of London*, no. 1457, 39–40; reprinted in *Quarterly Journal of the Geological Society of London*, **103** (1), 133–134. (Charles Dawson stated, wrongly, that the Piltdown gravel is situated at 80 ft above the level of the River Ouse, whereas it is only at 50–55 ft. W. J. Sollas (1924, 183) took Dawson's figure and converted it to 25 metres, and then equated the Piltdown terrace to the 30 m terrace of the Thames, thence drawing the deduction that the gravels are probably of Chellean age. 'Thus was a 50-foot terrace elevated to a 30-metres, or 100-foot, terrace.')

Edmunds, F. H. 1953. [Lewis Abbott's chemical treatment of the Piltdown skull.] In: Spencer 1990b, 222–223. (In a typewritten letter to K. P. Oakley, dated 24 Nov 1953, Edmunds recalls making the acquaintance of Lewis Abbott in 1924 while he was engaged in revising the geological map of the Lewes district for the Geological Survey. 'He himself told me that he had worked with Dawson on the Piltdown skull and that the skull had been in his possession in his house six months before Smith Woodward saw it; and I gathered from

him that he had soaked it in bichromate to harden it. I have every reason to believe that those statements were matters of fact. This has some bearing on the view as to who was the author of the forgeries you have detected...')

Edmunds, F. H. 1954. [Geological age of the Piltdown gravels.] *Proceedings of the Geological Society of London*, no. 1514, cxv–cxvi. (Written contribution to a discussion on 2 June 1954 demonstrating the results of new investigative techniques applied to the Piltdown assemblage. The author states that there was never any well-authenticated stratigraphical evidence to support the great antiquity claimed for the Piltdown gravels. The correct height of the deposit above the level of the River Ouse, stated by Dawson to be 80 ft, but in reality only 50 ft, could have been established in 1913 by reference to the contoured six-inch Ordnance Survey map. Until 1925 (Edmunds, in White 1926) there appears to have been no attempt to check Dawson's statement. Even after that date the implications of the check seem to have been generally unappreciated until 1935 when K. P. Oakley drew A. T. Marston's attention to the findings of Edmunds, as reported in Marston 1937, p. 394. It thus became clear that the Piltdown deposit had been wrongly correlated with the 100-foot terrace of the Thames, from which Marston had obtained the Swanscombe skull, whereas it actually correlated with the much younger 50-foot terrace of the Thames. See Beer 1954)

Edmunds, F. H. 1955a. The geology of the Piltdown neighbourhood. In: Further contributions to the solution of the Piltdown problem / J. Weiner, *et al.* *Bulletin of the British Museum (Natural History), Geology*, **2** (6), 273–275. (Includes a geological sketch map (Fig. 7) showing the 50-foot gravel terrace as surveyed by the writer for the Geological Survey in 1925. Prior to this date the Piltdown gravel had not been depicted on the Geological Survey map, which effectively gave scope for Dawson to place his own interpretation on the age of deposit. See Geological Survey of Great Britain. See Edmunds 1925 for reference to the geological field map from which Fig. 7 is derived.)

Edmunds, F. H. 1955b. [Book review:] The Piltdown Forgery, by J. S. Weiner. *Discovery*, **16** (3) Mar, 129–130. (The reviewer considers Weiner's efforts to identify the 'hoaxer' as unconvincing. Weiner's arguments 'seem to be compounded in part of assumptions, and personal opinions of the author.' Furthermore, 'Instances of unwarranted assumptions appear on pp. 149 and 185.' Thus, on p. 149 it is said that F. H. Edmunds may have passed on information about Dawson's use of dichromate to Woodward in 1926; and on p. 185 it is stated, from 'personal communication', that Edmunds in 1926 had been as bemused at Lewis Abbott's claim to have found a 'Hastings Lower Pleistocene bed' as had Dawson in 1913. To which the reviewer replies: 'All Mr. Edmunds can say is that he has no recollection of having done (1), and that it is most unlikely that he did so, and that (2) is equally unlikely.' Notes that 'the somewhat long list of errata bears witness to hurried production...')

Ehgartner, W. 1954. Das Ende des Piltdown-Dilemmas. *Anthropologischen Gesellschaft in Wien*, **83**, 200–204.

Ehrich, R. W. & Henderson, G. M. 1954. Concerning the Piltdown hoax and the rise of a new dogmatism. *American Anthropologist*, **56** (June), 433–436. (Not seen)

Eiseley, L. 1955. Fossil man and human evolution. *Yearbook of Physical Anthropology*, **1**, 61–78. (Discussion of the Piltdown forgery, pp. 65–67. Cited in Turrittin 2006)

Eiseley, L. 1956. Reviews: The Piltdown forgery, by J. S. Weiner...1955. *American Journal of Physical Anthropology*, **14** (1), 124–126.

Elliott, D. 1988. *The curious incident of the missing link: Arthur Conan Doyle and Piltdown Man*. Toronto: The Bootmakers of Toronto, Occasional Papers, no. 2, vi, 36 pp. (After a lengthy analysis of the case made against Conan Doyle by Winslow & Meyer 1983, the author concludes that no evidence has been put forward beyond the suggestive. See also under Addenda at the end of this Bibliography.)

Elliott, D. & Pilot, R. 1996. Baker Street meets Piltdown Man. *Baker Street Journal*, **46**, 13–28. (A rebuttal of the 'evidence' presented by Anderson 1996. Not seen)

Elliott, G. F. S. 1914. Prehistoric man. *Proceedings, Royal Philosophical Society of Glasgow*, **45**, 17–27. (Including a discussion of the age of the Piltdown remains. Elliott had earlier written to Smith Woodward on the subject: see Spencer 1990b, 63. Not seen.)

Elliott, G. F. S. 1915. *Prehistoric man and his story*. London: Seeley, xiv, 398 pp. (Piltdown woman, pp. 125–129. While supportive of Smith Woodward's reconstruction of the Piltdown remains, the author nevertheless notes that 'The jaw in some respects resembles that of a young chimpanzee.' He considers the skull to differ from modern man only to the extent in which it differs in some primitive races.)

Elsden, J. V. 1887. On the superficial geology of the southern portion of the Wealden area. *Quarterly Journal of the Geological Society of London*, **43** (4), 637–656, folded section. (The Ouse basin, pp. 646–8. Describes patches of raised river-terrace gravel at Crink Hill (near Barcombe Mill), Barcombe village and elsewhere in the valley of the River Ouse. ‘So far as the river-gravels are concerned, the Ouse north of Barcombe has very few patches of any importance, although small deposits occur at Isfield, Little Horsted, Buckham Hill, and Buxted Park, while loams and brickearth occur near Sheffield Bridge and Lindfield.’ No mention is made of the gravel at Barkham Manor, confirming that its presence was ostensibly unknown to geologists at this time. In opposition to the views of earlier authors, the writer argues that these raised gravels were deposited by the existing rivers before they cut down to their present levels. Previous writers had argued in terms of either catastrophic or marine deposition.)

Emerson, J. & Weiner, J. S. 1955a. The Piltdown mystery. I.—The Sussex Wizard. *Sunday Times*, 9 Jan, 4. (‘This fascinating study in real-life detection, written by Joyce Emerson in collaboration with Dr. J. S. Weiner, is based on Dr. Weiner’s forthcoming book “The Piltdown Forgery,” to be published...February 17.’ The subject is dealt with under the following heads: “Dawn Man”; The Scientific Tests; Deceiver or Dupe?; Curiosities Unearthed; The Darwinian Link. Also included is a tabulation of the Piltdown remains from Sites I and II, together with test results.)

Emerson, J. & Weiner, J. S. 1955b. The Piltdown mystery. II—The play of events. *Sunday Times*, 16 Jan, 4. (Castle Lodge; Plagiarism; Suspicion Grows; Fresh Finds; Evidence of the Tooth; Dawson’s Colleagues; The Jeweller. This last head concerns Lewis Abbott, about whom it is said: ‘If Abbot’s role can be defined, it must have been that of the reckless enthusiast, championing Piltdown Man without reserve; pronouncing upon all aspects of the finds—the antiquity of the gravels, the workmanship of the flints and even the significance of the bones.’ The Castle Lodge story prompted a correction by Salzman 1955b.)

Emerson, J. & Weiner, J. S. 1955c. The Piltdown mystery. III—“Watch C. Dawson”. *Sunday Times*, 23 Jan, 4. (Eoliths; The Lost Cabinet; A Dilemma; “Salting the Mine”; A Third Skull; Ambition. ‘In this hoax, there is [a] similarity with the Van Meegeren affair. Art historians, puzzled by the absence of any examples of Vermeer’s work dating from the middle period of his life, had, at the back of their minds, the idea that paintings from this period might one day be discovered. Van Meegeren supplied them with fakes which they did not hesitate to accept as the pictures they believed must exist. Dawson produced for the scientists the “missing link” in the form in which it had been eagerly anticipated and they were equally overjoyed.’ The finger of guilt (from Emerson) is clearly pointed at Dawson, yet ‘We have assumed that Dawson was the culprit, but, as Dr. Weiner points out, the arguments at our disposal are finally arguments by exclusion. The clues, however, seem to lead inexorably towards Dawson.’)

Ennouchi, E. 1954. Essai de chronologie à propos de l’homme de Piltdown. *Bulletin de la Société de Préhistoire du Maroc*, nouvelle série, 7/8, 93–103. (Cited in Turrittin 2006)

Esbroeck, G. van 1972. *Pleine lumière sur l’imposture de Piltdown*. Paris: Editions du Cèdre, 75 pp. (Accuses William Ruskin Butterworth, curator of Hastings Museum, of being the Piltdown forger in collusion with Venus Hargreaves, the labourer employed at Barkham Manor. His argument is that Butterworth was greatly put out on learning through a chance remark from Teilhard de Chardin, in 1909, that Dawson had quietly appropriated a series of bones of the dinosaur *Iguanodon* from a Hastings quarry and presented them to the Natural History Museum at South Kensington. He carried out the ‘hoax’ in revenge. This theory seems to ignore the evidence that Dawson had already made his first find at Piltdown probably in the previous year, assuming we accept the coconut story and the indirect evidence for the year in which that event occurred. Teilhard’s role in the Piltdown affair is discussed at some length. Reviewed by Thuillier 1972. Discussed in Spencer 1990a, 165–167 & Turrittin 2006, 29.)

Essex, R. 1955. The Piltdown plot: a hoax that grew. *Kent and Sussex Journal*, **2** (4), 94–95; reprinted in Bowden 1977. (‘A defence of Charles Dawson’. Robert Essex, a science master at Uckfield Grammar School, came into regular contact with Dawson during the period 1912–15 and witnessed a number of things that lead him to believe that Teilhard de Chardin (only referred to as ‘X’) was implicated in the ‘hoax’. See also Head 1971, and statements by Essex discussed and reproduced in Spencer 1990b, 230–235, 241.)

Estling, R. 1990. Leg before cricket. *New Scientist*, **128** (24 Nov), 67. (‘Solly Zuckerman’s attempt to point the finger of suspicion at Martin Hinton...comes to grief, I think, over the very fact that Hinton was a hoaxer—but a joking one, and not a serious-minded fraudster.’ The letter is accompanied by an editorial cartoon ‘The Neanderthal v. Cro Magnon Test Match’.)

Evans, J. 1863. The human remains at Abbeville. *Athenaeum*, **42**, 19–20. (The Moulin-Quignon jaw: see comments under Boucher de Perthes)

Evans, J. 1897. *The ancient stone implements, weapons and ornaments, of Great Britain*. 2nd ed. rev. London: Longmans, Green and Co, xviii, 747 pp, 2 plates. (In a discussion on the manner in which stone ‘celts’ were hafted, pp. 151–172, the author briefly alludes to the account by Charles Dawson (1894a) of a wooden-hafted flint hatchet, pp. 153–4, and remarks that ‘Neither the description nor the drawings of this and other objects found with it are such as to inspire complete confidence.’)

Evans, J. H. 1955. Farewell to Piltdown. *Archaeologia Cantiana*, **69**, 179–186. (Not seen)

Fagan, B. 1991. Book review: [Spencer 1990]. *Archaeology*, **44** (May/June), 58–60. (Cited in Turriff 2006)

Falconer, H. 1868. On the evidence in the case of the controverted human jaw and flint-implements of Moulin-Quignon. In: *Palaeontological memoirs and notes of the late Hugh Falconer...* / compiled and edited by C. Murchison. London: Robert Hardwicke, vol. 2, pp. 601–605. (See comments under Boylan 1979)

Falconer, H. (for Gibraltar skull see Keith 1911a)

Farrant, J. H. 2013. Prelude to Piltdown: Charles Dawson’s origins, career and antiquarian pursuits, 1864–1911, and their repercussions. *Sussex Archaeological Collections*, **151**, 145–186. (Although much has been written about Dawson’s either proved or alleged fabrications and misdeeds, little has been published on his earlier life with adequate documentation. Drawing on sources not previously used, this article describes his family background, upbringing and fossil collecting, together with his career as a solicitor, and explores his antiquarian pursuits in Sussex, particularly his association with Hastings Museum and with the Sussex Archaeological Society (including the Society’s ejection from Castle Lodge), his excavations at Hastings Castle and the Lavant caves, the Beauport Park statuette, the Pevensey Roman bricks, his *History of Hastings Castle* and his attempt to thwart L. F. Salzman’s election to the Society of Antiquaries. Also examined is the background to the fossil ‘mammal’ *Plagiaulax dawsoni* (dealt with in more detail in a digitally archived appendix). Much use was made of Peter Costello’s unpublished book (Costello 1989). The following 5 appendices (42 pp) are available from the Archaeological Data Service website: Appendix 1. Consolidated list of primary and secondary sources, pp. 2–7; Appendix 2. List of the published works of Charles Dawson, pp. 8–14; Appendix 3. Charles Dawson, ‘The Priory of Hastings. The old and the new. A pilgrimage’, *Hastings & St Leonards Observer*, 24 November 1888, pp. 15–20; *Plagiaulax dawsoni*, pp. 21–37; Appendix 5. The mourners at Charles Dawson’s funeral, 12 August 1916, pp. 38–41; Corrigenda to the main article, p. 42. Available at: http://archaeologydataservice.ac.uk/archiveDS/archiveDownload?t=arch-285-1/dissemination/pdf/vol_151/Farrant_ADS.pdf)

Farrar, R. A. H. 1979a. Sollas and the Sherborne bone. *Nature*, **277** (25 Jan), 260. (Points out a number of flaws in Halstead’s account of Douglas’s tape recording linking W. J. Sollas with the Piltdown ‘hoax’, but more particularly with respect to the Sherborne engraved bone controversy.)

Farrar, R. A. H. 1979b. The Sherborne controversy. *Antiquity*, **53** (Nov), no. 209, 211–216. (The author suggests that the falsity of the Sherborne engraved bone, as claimed by W. J. Sollas in 1924, is by no means a foregone conclusion. With a note on the antiquity of the Sherborne bone by K. P. Oakley, pp. 215–216. This prompted a communication from Sieveking 1980.)

Farrar, R. A. H. 1981. The Sherborne bone again. *Antiquity*, **55** (Mar), no. 213, 44–46, plate IV. (A reply to Sieveking 1980, including a report from Theya Molleson, of the Natural History Museum, on a study of photomicrographs of the Sherborne engraving. There was a further response from Sieveking 1981.)

Fedele, F. G. 1992 (contribution to discussion in Tobias 1992c: the writer is not convinced that Keith’s support for *Eoanthropus* is entirely to blame for the poor reception afforded to *Australopithecus*, and points out that there was a broader climate of opinion which inspired a coolness towards the early African finds. ‘One may even venture to suggest that the dismissal of Dart’s fossil was affected only slightly less by *Sinanthropus* than by the “Earliest Englishman” from Barkham Manor.’)

Feder, K. L. 1990. Piltdown, paradigms, and the paranormal. *Skeptical Inquirer*, **14** (4), 397–402.

Feder, K. L. 1990. *Frauds, myths, and mysteries: science and pseudoscience in archaeology*. Mountain View, California: Mayfield Publishing Co, 231 pp. (Dawson’s Dawn Man: the hoax at Piltdown, pp. 40–55. ‘A definitive answer to the question “whodunnit” may never be forthcoming. The lesson in Piltdown, though, is clear ... many were convinced by what appears to be, in hindsight, an inelegant fake. It shows quite clearly that scientists, though striving to be objective observers and explainers of the world around them, are, in the end, human. Many accepted the Piltdown evidence because they wished to—it supported a more comfortable view of human evolution [that the development of the brain led to the capacity for speech, rather than the

reverse]. Furthermore, perhaps out of naivete, they could not even conceive that a fellow thinker about human origins would wish to trick them...’)

Fernández, J. 1987. Sherlock Holmes va de cráneo. *Quimera*, **65**, 50–57.

Findlay, G. H. 1972. *Dr. Robert Broom, F.R.S.: palaeontologist and physician, 1866–1951: a biography, appreciation and bibliography*. Cape Town: A. A. Balkema, xv, 157 pp, 32 plates.

Forestier, A. 1912. A discovery of supreme importance to all interested in the history of the human race. *Illustrated London News*, **141** (28 Dec), supplement. (Caption to a double-page picture showing an impressionistic reconstruction of *Eoanthropus* hunting on the banks of the River Ouse. See Pycraft 1912 for further details. Amédée Forestier was a French born artist working for *The Illustrated London News* who became known for his carefully researched drawings of archaeological finds and prehistoric man. His hypothetical construction of the head of Piltdown Man, which also featured in Pycraft’s article, is reproduced on the front cover of this *Bibliography*.)

Forestier, A. 1913. Periods of prehistoric man: Pleistocene types, weapons and tools. *Illustrated London News*, **143** (23 Aug), 296–297. (Numerous figures, including Keith’s reconstruction of the Piltdown jaw)

Forestier, A. (see also Anon. 1912b, Woodward 1934)

Fraipont, J. & Lohest, M. 1887. La race humaine de Néanderthal ou de Canstadt en Belgique: recherches ethnographiques sur les ossements humains découverts dans les dépôts quaternaires d’une grotte à Spy et détermination de leur âge géologique. *Archives de Biologie* (Paris), **7**, 587–757, plates XVII–XX. (Prior to the discovery described here, fossil remains of ancient man (now known to be Neanderthal) had been found at Engis (Belgium, 1829–30), Gibraltar (1848) and in the Neander valley (Germany, 1856). But as Spencer (1990a, 10) has pointed out: ‘...the evolutionary significance of these fossils went unrecognized until the discovery of “two remarkable human skeletons” at Spy, near Goyet, in the Belgian province of Namur, in 1886. Their discovery in association with the remains of several extinct mammals and a collection of stone implements closely resembling the Palaeolithic industry known as the Mousterian, left little doubt as to their geological age and also permitted Julien Fraipont (1857–1910), the Belgian anatomist and palaeontologist (who had been invited to examine this material) to forge an anatomical connection between the Spy skeletons and the remains from the Neander valley. From this emerged the first composite picture of the European Neanderthals, whom Fraipont characterized as being short in stature, but powerfully built, with strong and curiously curved thigh bones which seemingly must have required them to walk with a bend at the knees... but like others before him Fraipont believed this ancient form of humanity did little to bridge the structural gap between man and ape.’ See also comments under Woodward 1898.)

Frassetto, F. 1918. *Lezioni di antropologia*. Vol. I. New ed. Milano. (*Eoanthropus*, pp. 340–343. Cited in Quenstedt 1936)

Frassetto, F. 1927. New views on the “Dawn Man” of Piltdown (Sussex). *Man*, **27**, 121–124, plate. (Puts forward a new interpretation of the Piltdown jaw as belonging to a fossil orangutan, an argument also advanced by Friederichs in 1932)

Freudenberg, W. 1915. [Review of Dawson & Woodward 1913a, Woodward 1913, and Dawson & Woodward 1914b.] *Neues Jahrbuch für Mineralogie, Geologie und Paläontologie*, Jahrgang 1915, **1** (3), 416–420. (Woodward’s *Stegodon* sp. is here referred to *Elephas* cf. *planifrons*)

Freudenberg, W. 1920. Die Entdeckung von menschenlichen Fußspuren und Artefakten. *Prähistorische Zeitschrift*, ser. 2, **12**, 1–56. (*Eoanthropus*, pp. 53–54. Cited in Quenstedt 1936)

Freudenberg, W. 1925. Der Tertiärmensch in England. *Naturwissenschaften*, **13**, 452–455. (Considers the Piltdown and Foxhall finds. Cited in Quenstedt 1936)

Friederichs, H. F. 1932. Schädel und Unterkiefer von Piltdown (“*Eoanthropus dawsoni* Woodward”) in neuer Untersuchung. *Zeitschrift für Anatomie und Entwicklungsgeschichte*, **98**, 199–266. (Considers the jaw to represent that of a fossil orangutan, an argument first put forward by Frassetto in 1927. The jaw is here assigned to *Boreopithecus dawsoni*, and the skull to *Homo piltdownensis*. Includes a preface by Franz Weidenreich.)

Fryd, C. F. M. 1955. Chemical changes in bones: a note on the analyses. In: Further contributions to the solution of the Piltdown problem / J. S. Weiner *et al.* *Bulletin of the British Museum (Natural History)*,

Geology, **2** (6), 266–267. (Full details of the experimental work carried out in the Government Laboratory appear in Hoskins & Fryd 1955)

Fuller, C. 1979. The Piltdown hoax. *Fate*, **32** (May), 10–11. (Not seen; not listed in Turrittin 2006)

Gardiner, B. G. 1987. Lady Smith Woodward's tablecloth. *The Linnean*, **3** (3), 24–26. (Quotes in full a letter from George Gaylord Simpson, one-time owner of the celebrated tablecloth bearing many notable signatures. The letter was written to Charles Blinderman on 21 Sept 1984 in response to a request for information about Arthur Smith Woodward and Piltdown. Simpson had been invited to visit the Woodwards at their home in 1926 while he was researching Mesozoic mammals. With respect to the Piltdown forgery, he notes that 'This was the one [*sic.*] great mistake in all of Smith Woodward's extremely voluminous work. He certainly never knew that his *Eoanthropus dawsoni* was a hoax... He had, as he told friends, hoped to be made Director of the B.M.(N.H.). It has been said that he was so angry at not being made Director that he never entered the building or spoke to anyone still on the staff... I hope your book about the Piltdown hoax does not blame this on either Sir Arthur Smith Woodward or Père Pierre Teilhard de Chardin. As regards the latter, Steve Gould's piece in *Natural History* for August, 1980 simply is not true or at best is not logical or acceptable. Teilhard, whom I knew very well, happened to be at the [American Museum of Natural History] when the discovery that Piltdown man was a hoax was made known. Teilhard told me that he had never before known and that it had never occurred to him as possible that "*Eoanthropus*" was a hoax. Father Teilhard, S.J., was often mistaken, but to my knowledge he never lied outright. Who dunit? Most likely Dawson alone. For one more bit of evidence, he had perpetrated a previous hoax.' See comment under Simpson 1928.)

Gardiner, B. G. & Currant, A. 1996. *The Piltdown hoax: who done it?* Linnean Society of London, 8 pp. (Printed text of a Linnean Society presidential address delivered by Prof. Brian Gardiner on 24 May, in which Martin Hinton is accused of perpetrating the 'hoax'. Reported by Gee 1996. Available at Clark University Piltdown Plot website.)

Gardiner, B. G. 2003. The Piltdown forgery: a re-statement of the case against Hinton. *Zoological Journal of the Linnean Society*, **139** (3), 315–335. (Tom Turrittin in his 'A Piltdown Man reading list' (Mar 2006, Richard Harter's World), states that 'Gardiner's data is not convincing. He used no control groups, and there was no methodology set out beforehand for proof or disproof. In other words, it was extremely one-sided and unscientific. Gardiner and Currant's historical arguments are equally weak. If you know enough about the history of the Piltdown forgery, you can just as easily argue against this theory.')

Garner-Howe, V. 1997a. Piltdown. *Current Archaeology*, **13** (7), no. 151, 277. (Correspondent was told by Lady Smith Woodward, sometime after the Second World War, that her husband 'never forgave himself for being taken in by the forgery and felt ashamed about it for the remainder of his life.' Compiler's note: This statement is at odds with the evidence of his book *The Earliest Englishman*, which according to its preface was completed by him the day before he died and subsequently brought to publication by Maud Woodward herself! Her remarks, if made after 1953, were most likely a defensive fabrication. There is no clear evidence that her husband was aware of fraudulence, yet nagging doubts might explain the continuing explorations at Piltdown following his retirement, and might indeed have provided a slim basis for Maud Woodward's remarks.)

Garner-Howe, V. 1997b. Pilt versus Pit. *Sussex Past & Present*, no. 81 (Apr), 14. ('As a child of 11 plus, I was fascinated by the history and stories of the past and used to talk to local people at Piltdown where we always spent our holidays. This was before World War One.' She learned from the village postmaster that the name was previously Pilt Down (a fact confirmed by 19th-century Ordnance Survey maps), while the golf course green-keeper, Varnham, whose family had lived at Piltdown for generations, told her that 'the place was originally called Pit Down, the name derived from the pit where bodies from the Plague had been buried. This pit was the highest point of the common, on the opposite side of the road to the building known as the Chapel with two very tall trees beside it... With regard to the Piltdown forgery, as children we watched two men one evening as they were scraping the bank and my father spoke to 'Professor' Woodward and asked if there had been any further finds. The answer was "I'm afraid not."' The reputed burial of plague victims at Piltdown is also recorded by Costello 1985, who suggests that the Piltdown skull might be linked to such burials, although the common is at some distance from Barkham Manor.)

Gee, H. 1996. Box of bones 'clinches' identity of Piltdown palaeontology hoaxer. *Nature*, **381** (23 May), 261–262. (Summary of Linnean Society presidential address to be given by Brian Gardiner on 24 May in which Martin Hinton is accused of perpetrating the 'hoax', on the evidence of an old canvass trunk bearing his initials and containing mammalian bones and teeth, stained and carved. The report prompted reactions from Dempster 1996, Hall 1996, Lutes 1996, Sieveking 1996. For other reactions see Turrittin 2006, 21–22.)

Geological Survey of Great Britain 1893. One-inch to the mile geological map [Old Series], England & Wales, sheet 5: geology published Dec 1864; new edition published Nov 1893, Chalk & Tertiary areas revised by W. A. E. Ussher and C. Reid. [London: Geological Survey, engraved by Ordnance Survey & hand-coloured at the Geological Survey], 1 sheet. (The Geological Survey map at this time contained only limited information on superficial, or 'drift', deposits. Alluvium is depicted together with the more obvious river valley gravels, here termed simply 'Valley Gravel'. The well known spreads of gravel at Barcombe and Barcombe Mills are shown, but none of the smaller spreads had been recognised or surveyed in the upper reaches of the River Ouse valley; neither were individual terraces recognised. This is the official geological map that would have been consulted at the time of the Piltdown 'discoveries'. The map covers much of East Sussex, including Newhaven, Lewes, Eastbourne, Hastings and Winchelsea. The river deposits, including the older terrace deposits, were revised in 1925 (Edmunds 1925) and transferred to New Series sheet 319 Lewes, published in 1926 and accompanied by a descriptive memoir (White 1926). The area was resurveyed at a scale of 1:10 560, or six inches to the mile, in stages between 1964 and 1973. C. R. Bristow (1964) was responsible for remapping the area around Piltdown. The new information was issued on sheet 319 in 1979, accompanied by a new descriptive memoir by Lake *et al.* 1987.)

Gibb, J. H. B. 1978. Bone of contention. *The Times*, 4 Nov, 15. (The writer, of Sherborne School, Dorset, describes the background to the Sherborne engraved bone discovery, which Prof Douglas claims was falsely dismissed by Sollas in 1924 in order to embarrass Smith Woodward. A response to Halstead 1978a)

Giret, R. 2003. L'homme de Piltdown. In: *Le sens de l'Evolution en question?* Association des Amis de Pierre Teilhard de Chardin / Colloques Internationaux Teilhard de Chardin. Paris: Aubin Editeur, pp. 147–150. (Not seen)

Gish, D. T. 1985. *Evolution: the challenge of the fossil record*. El Cajon, Ca: Creation-Life Publishers, 278 pp. (Discussion of the Piltdown fraud, pp. 188–190. According to Duane Gish, the example of Piltdown, along with 'Nebraska man' (*Hesperopithecus*, based on a fossil tooth which turned out to belong to an extinct pig) and other cases of incorrect or disputed fossil identifications, shows that the so-called experts are easily fooled and don't really know what they are talking about. In addition, palaeoanthropologists, along with other evolutionists, allow preconceived ideas to govern their scientific conclusions. Gish's case against human evolution is shot through with omissions, distortions and non sequiturs. It is not a serious scientific discussion. It is meant for the public, which creationists hope to influence in their campaign to curtail instruction in evolution in public schools while ensuring that creationism is presented as an intellectually respectable alternative. From Harrold 1992.)

Giuffrida-Ruggeri, V. 1913a. *L'uomo attuale, una specie collettiva*. Milano: Albrighi, Segati e C, 192 pp, 13 plates. (Briefly alludes to the Piltdown finds, pp. 120–121. The author is puzzled by the statement of Dawson and Woodward that they regard Piltdown as a contemporary of Heidelberg Man, and that flints of the Chellean type were found with the remains—flints of that type being considered much later in date than the Heidelberg jaw. At this stage it is impossible for him to make any further statement regarding the nature of *Eoanthropus* until figures, or better still, models of the remains are at his disposal. See review, probably by Arthur Keith, in Anon. 1913h)

Giuffrida-Ruggeri, V. 1913b. [Review of Dawson & Woodward 1913a]. *Archivio per l'Antropologia e la Etnologia*, **43**, 184–186. (While accepting Woodward's argument for a connection between the Piltdown jaw and skull, the author registers some doubts about the distinctness of the genus *Eoanthropus* from *Homo*; Spencer 1990b, 63.)

Giuffrida-Ruggeri, V. 1917. La successione e la provenienza delle razze europee preneolitiche e i pretesi Cro-Magnon delle Canarie. *Rivista Italiana di Paleontologia*, **22** (4), 59–67. (In discussing the status of Piltdown Man, pp. 59–61, the author concurs with the views of Miller 1915 and Osborn 1916 in seeing no connection between the jaw and skull, for which he accepts the designations *Pan vetus* and *Homo dawsoni* respectively. He thinks that European anthropologists have taken a deferential position with regard to the views of Elliot Smith and Arthur Keith, yet the incompatibility between jaw and skull is clear.)

Giuffrida-Ruggeri, V. 1918. Unicità del phylum umano con pluralità dei centri specifici. *Rivista Italiana di Paleontologia*, **24** (1/2), 13–25. (Comments on '*Homo dawsoni*', pp. 21–22. The writer remains sceptical about the claimed association between the Piltdown skull and jaw, at least until such time as a second individual is found. He had evidently not yet seen the formal paper by Woodward 1918 announcing the discovery of Piltdown II.)

Giuffrida-Ruggeri, V. 1919. La controversia sul fossile de Piltdown e l'origine del phylum umano. *Monitore Zoologico Italiano*, **30** (1/2), 7–18.

Giuffrida-Ruggeri, V. 1921. *Su l'origine del uomo: nuove teorie e documenti*. Bologna, 267 pp, 13 plates. (Piltown, pp. 83–89, etc. Cited in Quenstedt 1936)

Given, J. C. M. 1914. Recent discoveries of fossil man. *Liverpool Medico-Chirurgical Journal*, **34** (July), 227–242. (Finds at Piltown, pp. 234–244. With reference to the lower jaw he notes that 'In August last the canine tooth belonging to this half of the jaw turned up, and Dr Smith Woodward informs me that by carefully putting the earth and gravel through fine-meshed sieves, he has found both the nasal bones and some small fragments of what he thinks is the vomer. The bones were all found lying close together. Mr Dawson first found one fragment by chance, some time before the others, and this had been already dug up by workmen.' The writer goes on to provide a detailed anatomical description of the jaw and cranium.)

Glover, M. J. & Phillips, G. F. 1965. Chemical methods for the dating of bones. *Journal of Applied Chemistry*, **15**, 570–576. (Including a discussion of the techniques employed on the Piltown remains)

Godwin-Austen, R. A. C. (Dawson, in Dawson & Woodward 1913a, cites Godwin-Austen (Austen 1851) and Dixon 1878 with reference to the occurrence of Pleistocene elephant in the gravels at Barcombe. It is possible that the reference to elephant in these gravels is spurious or results from a misunderstanding. Austen 1851 (he later adopted the surname Godwin-Austen) does not appear to speak from personal knowledge when he states that large mammals have been found in the Barcombe gravels (assuming that the 'accumulation' in which these fossils occur actually relates to the gravels at Barcombe mentioned in his previous sentence: see quote under Austen 1851). Mantell 1833, 41–43, in his account of the 'Organic remains of the Diluvial deposits' of Sussex (under which term he includes both terrace gravels and Head deposits), records the remains of elephant near Arundel and at Brighton, Hove and Patcham, but makes no reference to mammalian remains in the river gravels at Barcombe. In the introduction to his chapter on 'Diluvium' (p. 27), Mantell states that 'It is in these accumulations of diluvial debris, that the bones and teeth of elephants, horses, and other quadrupeds, are discovered.' It is possible that Austen actually had this general statement in mind when he referred to finds of large mammals. See also Mantell 1833 and Dixon 1878.)

Goodwin, A. J. H. 1953. The curious story of the Piltown fragments. *South African Archaeological Bulletin*, **8**, no. 32 (Dec), 103–105. (Not seen)

Gornall, J. 2003a. Elementary, my dear scientists: is this proof that Conan Doyle was the Piltown hoaxer. *The Times*, 31 July, T2.11. (The writer has been searching for clues to Conan Doyle's possible connection with the Piltown fraud. Desperate for something, anything, he finally gets a clue from Richard Milner of the American Museum of Natural History, who points him to a possible cryptogram which can be found in chapter XV of *The Lost World*. There is a passage in the book where the explorers are handed a slip of bark by a native, upon which is written in charcoal a series of 18 marks in a line looking at first sight 'like some sort of rough musical score.' Malone is convinced, from the expression on the native's face, that the marks signify something important. "Unless," says Summerlee, "we have come upon a primitive practical joker, which I should think would be one of the most elementary developments of man." See Gornall 2003b)

Gornall, J. 2003b. Code comfort: has Conan Doyle's supposed Piltown cryptogram made monkeys of us all? *The Times*, 19 Sept, T2.7. ('A few weeks ago we asked *Times* readers if they could crack what appeared to be a cryptogram in the 1912 Arthur Conan Doyle story *The Lost World*... The challenge, to a readership sharpened by daily combat with *The Times* crossword, proved irresistible to many. It also proved too much, and Conan Doyle's possible involvement in the 1912 fraud remains unproven.' There then follows a number of, shall we say, interesting interpretations from *Times* readers. It should however be pointed out that the 'cryptogram' reproduced in the *Times* article is not the same as that which appears on p. 287 of the first English edition of *The Lost World*; while in the American edition (p. 277) it is different again, and is both reversed and upside down! The name Curupuri is here misattributed: see Hammerton 2003)

Gould, S. J. 1979a. Piltown revisited. *Natural History*, **88**, (3), 86–97. (A consideration of the historical conundrum 'why did anyone ever accept Piltown man in the first place?')

Gould, S. J. 1979b. Smith Woodward's folly. *New Scientist*, **82** (5 Apr), 42–44. (Slightly edited version of Gould 1979a. See reaction from Oakley 1979b)

Gould, S. J. 1980a. *The panda's thumb: more reflections in natural history*. New York: W. W. Norton & Co; published in Pelican Books 1983, reprinted Penguin Books 1990. (Essay 10: Piltown revisited, pp. 92–104 of Penguin edition, reprinted from *Natural History*, Mar 1979, with additional postscript in which he puts forward a more forceful case, suggested but dismissed in the original article, implicating Teilhard de Chardin as co-conspirator with Dawson.)

Gould, S. J. 1980b. The Piltdown conspiracy. *Natural History*, **89**, (8), 8–28. (Develops his case implicating Teilhard de Chardin. The paper prompted reactions from Berry 1980, Costello 1981a, Daniel 1981, Dodson 1981, Koenigswald 1981, Lukas 1981, McCulloch 1981, Schmitz-Moormann 1981, Washburn 1981a, and others, all of which were adversely critical of Gould’s argument. See Turrittin 2006, 26–27, for discussion and further references.)

Gould, S. J. 1981. Piltdown in letters. *Natural History*, **90**, (6), 25–30. (Reply to letters of criticism from Professors Dodson, Washburn, and Koenigswald, following the publication of his article (Gould 1980b) in the Aug 1980 issue of *Natural History*)

Gould, S. J. 1983a. *Hen’s teeth and horse’s toes*. New York: W. W. Norton & Co. (Essay 16: The Piltdown conspiracy, pp. 201–226, reprinted from *Natural History*, Aug 1980, with additional footnotes. Essay 17: A reply to critics, pp. 227–240, written for this volume as a commentary in response to further criticism received in connection with Gould 1980b subsequent to the correspondence already published in the June 1981 issue of *Natural History* (Gould 1981). This book contains the most complete statement of Gould’s views on the matter. A key element in Gould’s argument—Teilhard’s supposed knowledge of the Sheffield Park site in 1913, two years before Dawson announced the finding there of Piltdown II—was subsequently shown by Spencer 1990a to be incorrect: see comments under Tobias 1992.)

Gould, S. J. 1983b. Piltdown debate: not so elementary. *Science* **83**, **4** (9) Nov, 22–23. (A response to Winslow & Meyer 1983, which attempted to implicate Conan Doyle. Gould is primarily concerned with their criticism of his case against Teilhard. ‘As to their case for Conan Doyle, what can one say of an evidence-free argument based on speculations about motive?’)

Gould, S. J. (for an interesting interpretation of Gould’s scientific debating method, see McCulloch 1983)

Goulden, M. S. 2009a. *Excavating humanness: palaeoanthropology at the human–animal boundary*. University of Nottingham: unpublished PhD thesis. (Includes a section ‘On popular representations of Piltdown Man’. Not seen)

Goulden, M. S. 2009b. Boundary-work and the human–animal binary: Piltdown man, science and the media. *Public Understanding of Science*, **18**, 275–291. (Neither the title nor the paper’s abstract is understandable, making this a worthy addition to the mad, bad world of Piltdown)

Graves, P. 1992 (contribution to discussion in Tobias 1992c: ‘Tobias’s review presents an authoritative and convincing[?] account of this intractable case.’ The writer goes on to discuss the wider issue of ethics in the presentation of science, admitting that scientific fraud has become a growth industry. ‘In anthropology and archaeology it often seems as if the adoption of a controversial position, whether one believes it or not, has become essential to any “hard-sell” bid for notoriety. This is at least dishonesty, if not fraud. Meanwhile, with the growth of relativistic paradigms in some areas of debate, it almost seems as if the concept of truth is considered obsolete!’ See also Medawar 1963.)

Grayson, D. K. 1983. *The establishment of human antiquity*. New York: Academic Press, xii, 262 pp. (Cited in Spencer 1990a)

Gregory, W. K. 1914a. The Dawn Man of Piltdown, England. *American Museum Journal*, **14** (5), 188–200. (Gregory was a vertebrate palaeontologist based at the American Museum of Natural History in New York City. He visited Smith Woodward to view the Piltdown material in September 1913 (Spencer 1990b, 102–103). Concerning the Piltdown remains he states: ‘It has been suspected by some that geologically they are not old at all; that they may even represent a deliberate hoax, a negro or Australian skull and a broken ape jaw, artificially fossilized and ‘planted’ in the gravel-bed, to fool the scientists’. Against this suspicion he notes that ‘none of the experts who have scrutinized the specimens and the gravel-pit and its surroundings has doubted the genuineness of the discovery.’ With respect to the Piltdown jaw, an illustrated comparison is made with those of a female orangutan and a modern negro. At this stage Gregory was inclined to accept an association between the Piltdown jaw and skull.)

Gregory, W. K. 1914b. The Dawn Man of Piltdown: was he one of the missing links? *Scientific American, Supplement*. (Not seen, but Blinderman 1986, 85, has the following quote: ‘Of first importance is the question of the age of these remains, and in considering this the suggestion that has been made that there was anything in the nature of a “plant” or hoax may be disregarded in view of the circumstances of the discovery.’)

Gregory, W. K. 1916a. Studies on the evolution of the primates. II. Phylogeny of recent and extinct anthropoids, with special reference to the origin of man. *Bulletin of the American Museum of Natural History*, **35**, 258–355. (Shares the view of Miller 1915 that the Piltdown mandible belongs to a Pleistocene species of chimpanzee, pp 313–320, 323, 345–347; with an appendix by W. D. Matthew on the association of the Piltdown skull and jaw, 348–350.)

Gregory, W. K. 1916b. Note on the molar teeth of the Piltdown mandible. *American Anthropologist*, new ser, **18**, 384–387. (In view of Gerrit S. Miller's detailed comparisons between the Piltdown jaw and teeth, and those of a large series of chimpanzees, the author concurs with Miller's view that the former represents an extinct species of chimpanzee.)

Gregory, W. K. 1920. The origin and evolution of the human dentition: a palaeontological review (continued). *Journal of Dental Research*, **2** (4), 607–717. (Piltdown, pp. 680–88, 696–97. Cited in Quenstedt 1936)

Gregory, W. K. 1929. *Our face from fish to man*. New York & London: G. P. Putnam, 295 pp. (*Eoanthropus*, pp. 72, 141, 143, including figs 37, 38, 41, 42, 45); 2nd ed. Capricorn Books, 1965.

Gregory, W. K. & Hellman, M. 1926. The dentition of *Dryopithecus* and the origin of man. *Anthropological Papers American Museum of Natural History*, **28** (1), 1–348. (Including discussion of Piltdown molars)

Gregory, W. K. (see also Matthew, Eastman & Gregory 1916, Osborn & Gregory 1923; for biographical memoirs see Colbert 1975, Washburn 1981)

Grigson, C. 1990a. Missing links in the Piltdown fraud. *New Scientist*, **125** (13 Jan), 55–58. (Suggests that Frank Barlow, chief preparator in the Geology Department at the Natural History Museum, may have been Dawson's accomplice. It is argued that Barlow had a financial stake in the production and sale of casts of the Piltdown Man restoration along with the individual components. See Grigson 1992 for addendum.)

Grigson, C. 1990b. Putting the pieces together. *Times Literary Supplement*, 14 Dec, 1343. (Review of *Piltdown: A scientific forgery* and *The Piltdown papers*, by F. Spencer. See reply by Spencer 1991b, and response, Grigson 1991. Not seen)

Grigson, C. 1991. Sir Arthur Keith and the Piltdown forgery. *Times Literary Supplement*, 1 Feb, 13. (A reply to Spencer 1991b. Not seen. Much of what she said was reiterated in Grigson 1992.)

Grigson, C. 1992 (contribution to discussion in Tobias 1992c: refutes several of Spencer's/Tobias's so-called pointers to Keith's guilt in the Piltdown affair. For example, she rightly points out that Dawson's visits to the museum of the Royal College of Surgeons in search of the 13th vertebra did not require him to meet with Keith. Dawson himself made it clear, in a letter to Woodward (Dawson 1912), that he had been obliged to photograph examples displayed in the glass cases 'under the nose of Keith and his assistant', implying an element of subterfuge on his part. Grigson objects to the suggestion made by Spencer 1991b that her defence of Keith is in consequence of her Royal College of Surgeons affiliation. She notes that 'whilst my researches in the Royal College's archives have led me to admire Keith for his persistence in encouraging research in the college and defending its museum, they have also convinced me that he was a conceited, humourless bore with very little knowledge of archaeology.' Following publication of Grigson 1990a she received several letters from people who had known Frank Barlow, from which it transpires that he and two other colleagues, A. H. Bishop and C. A. Wray, "were inveterate practical jokers up to all kinds of pranks." She concludes, 'Is it too much to suppose that Dawson joined a bunch of jokers at the BMNH to perpetrate one of the most successful practical jokes of all time—so successful, indeed, that nearly 80 years later we are still wasting time on it?')

Haddon, A. C. 1913. *Eoanthropus dawsoni*. *Science*, **37** (17 Jan), 91–92. (Cited in Quenstedt 1936)

Haddon, A. C. 1924. *The races of Man and their distribution*. 2nd ed. Cambridge: Cambridge University Press, viii, 184 pp, 10 plates. (*Eoanthropus*, p. 54. Cited in Quenstedt 1936)

Hall, E. T. 1953. *Quantitative analysis by secondary x-rays for use particularly in archaeology*. University of Oxford: unpublished DPhil thesis. (Including an account of its application to the Piltdown remains)

Hall, E. T. 1955. The spectroscopic methods of analysis in archaeology. *Advancement of Science*, **12**, no. 45, 8–11. (Hall applied X-ray fluorescence spectroscopy to determine the nature of the staining of the Piltdown remains in 1953, which is here only briefly noticed, thus: 'Lastly, might be mentioned the use of the X-ray spectrometer in identifying the chromate and iron staining of the Piltdown fragments and flints.

Here we have a typical example where this type of non-destructive investigation can be of use on unique specimens. Moreover, since the staining, particularly of the flint, was extremely thin, but covered a comparatively large surface, the method was extremely sensitive in the estimation of the chromium present.’)

Hall, E. T. 1996. Riddle of the tenth man. *Nature*, **381** (27 June), 728. (With reference to the claims of Brian Gardiner reported in Gee 1996, the writer points out that whereas manganese was reported to be present on the stained teeth found in Hinton’s old trunk, there was no trace of it on the Piltdown material, and there is thus no similarity. He further points out that potassium dichromate, and not chromic acid, was used in the staining process. Likewise Gee’s report is incorrect in stating that the orangutan jaw was not stained in the same way as the other Piltdown artefacts. All of this is detailed in Hall’s thesis, 1953.)

Hall, E. T. (see Oakley & Weiner 1953; for obituaries see Anon. 2001, Young 2001)

Halstead, L. B. 1978a. New light on the Piltdown hoax? *Nature*, **276** (2 Nov), 11–13. (Presents the substance of a tape recording made by Prof J. A. Douglas in which it is suggested that Dawson may have been aided by W. J. Sollas. The first published announcement of this new accusation had appeared in *The Sunday Telegraph* a few days before (Holliday & Williams 1978) although the tape-recording had been played at a symposium of Comparative Anatomy and Palaeontology at the University of Reading in September. Reports also featured in *The Times* (Parker 1978) and *The Guardian* (Pallister 1978). Reactions to these features appeared from Gibb 1978, Oakley 1978, Wade, 1978, Weiner 1979, Langham 1979, Farrar 1979a, Daniel 1979; for other responses see Turriffin 2006, 20.)

Halstead, L. B. 1978b. The Piltdown hoax. *The Times*, 25 Nov, 13. (Reply to Oakley 1978, in which the writer states that he has found no evidence that Sollas ever used potassium dichromate in the preparation of serial sections, a method of investigation pioneered by Sollas. Halstead then goes on to implicate Martin Hinton of the Natural History Museum, based on ‘evidence’ that he supplied Piltdown’s orangutan jaw from the museum collections. ‘The current scenario would seem to be one of an extensive conspiracy involving Hinton, a few other colleagues in the Museum, with Teilhard de Chardin contributing a Tunisian elephant tooth and the “missing” canine. The expertise involved in the wide extent of the Piltdown hoaxes still assuredly points to Sollas.’ Awkwardly for Halstead’s elaborate thesis, Hinton always professed the jaw to be that of a chimpanzee—a bluff perhaps? See Hinton 1953. There was a further response from Oakley 1979a following Halstead’s reply to Weiner.)

Halstead, L. B. 1979. The Piltdown hoax: *cui bono*? *Nature*, **277** (22 Feb), 596. (Reply to Weiner’s criticism of his support for the case against W. J. Sollas. This prompted another response from Oakley 1979a concerning Sollas’s use of potassium dichromate)

Halstead, L. B. (for a biographical notice see Sarjeant 1993)

Hammerton, M. 2003. Conan Doyle ‘mystery’. *The Times*, 27 Sept, 29. (With reference to the supposed messages encoded by Sir Arthur Conan Doyle in *The Lost World* (Gornall 2003b), the correspondent notes that the Curupuri mentioned in the book is not a reference to ape-men, but to the spirit of the woods. ‘Later, when the Dauntless Four encounter ape-men on the plateau, the two professors differ as to whether they should be classified as *Dryopithecus* or as *Pithecanthropus*: there is no mention of Piltdown’s *Eoanthropus*.’ Prof Hammerton slips up here, because *Eoanthropus* was not formally announced until after the publication of Doyle’s *Lost World*.)

Hammond, M. 1979. A framework of plausibility for an anthropological forgery: the Piltdown case. *Anthropology*, **3** (1/2), 47–58. (An examination of the preceding factors that helped to make Piltdown Man believable in 1912. From Turriffin 2006, who elsewhere has described this as ‘an excellent summary’.)

Hammond, M. 1988. The shadow man paradigm in paleoanthropology, 1911–1945. In: *Bones, bodies, behavior: essays on biological anthropology* / edited by G. W. Stocking, Jr. Madison: University of Wisconsin Press, pp. 117–137. (Examines the period when human fossils were frequently put on dead side-branches of mankind’s family tree, in favour of a theoretical presapiens ancestor. Cited in Turriffin 2006)

Hammond, N. 1980. Expert views differ on Jesuit’s role in the Piltdown Man forgery. *The Times*, 15 July, 17. (The theory that Teilhard de Chardin helped to perpetrate the Piltdown Man forgery has received support from Dr. Kenneth Oakley, formerly of the Natural History Museum. He said that ‘a letter written to him by Teilhard in 1954 had given him “strong indications that Teilhard was in collusion with Charles Dawson.”’ Professor Joseph Weiner, however, said that the charge was “little more than conjecture.” After quoting further the independent views of Oakley and Weiner, the piece ends by noting that ‘Rumour in the academic

world has it that documentary proof of Teilhard's guilty collusion with Dawson exists, but is being suppressed by the scholar who holds it.' See response from Oakley 1980b)

Hammond, N. 1996. Was Piltdown's finder its faker? *The Times*, 31 Oct, 22. (A review of Walsh 1996. 'Yet another solution to the Piltdown mystery has been proposed, which for the first time in decades does not involve ruining the reputation of a distinguished scientist. Instead, the Sussex solicitor Charles Dawson, the "discoverer" of Piltdown Man, is fingered as the only villain... Mr Walsh suggests that one reason for Dawson's actions, in pursuit of scientific honours...may have been sibling rivalry. His younger brother Trevor was knighted, and then made a baronet.'))

Hammond, N. 1997. Piltdown skull linked to Saxon cemetery. *The Times*, 31 Mar, 22. (A summary of the recent claims of John Clements of the Hastings Museum Association, who believes that Dawson could have sourced the Piltdown skull from material excavated from a 6th century cemetery on Hastings East Hill in 1858. Amongst the material was one very thick skull. Two more thick skulls were found in 1912, and vanished a few months before Piltdown Man was 'discovered'. Dawson was closely associated with the museum and thus would have had free access to the material. See Clements 1997a-b.)

Hampton, F. A. ('During the 1970s it was reported that the psychiatrist Frank Anthony Hampton (1888–1967) had confessed to a friend that he had concocted the Piltdown forgery. A subsequent investigation of Hampton by Dr H W Ball (former Keeper of the Department of Palaeontology [NHM]) and Dr Ian Langham failed to substantiate the story. A review of this file, and subsequent evidence recovered from Kenneth Oakley's private papers relating to Hampton simply do not support Hampton's reported confession.' From Spencer 1990a, 237, n. 86. The file referred to is held by the Natural History Museum.)

Hansen, C. 1983. A questionable theory – Dr. Watson's neglected patients. *Medical Bulletin*, **9** (2), 61–64. (A comment on the accusations made by Winslow & Meyer 1983 against Conan Doyle. Not seen.)

Hargreaves, V. (Venus Hargreaves was the farm labourer employed by Dawson and Woodward to break up and dig the loosely cemented gravel at Barkham Manor. He features in a number of photographs of the excavation site. Francis Vere (1955), concerned only with defending Dawson, suggested that the Piltdown forger was one of the diggers who had been hired to work at the Piltdown site, implying Hargreaves. Esbroeck 1972 has also implicated Hargreaves in league with William Butterfield.)

Harris, W. E., Woodward, A. S. & Keith, A. 1921. On the Broken Hill skull. *Illustrated London News*, 680–687. (Comparison with Piltdown, p. 682, & illus, pp. 680 & 683. See comments under Woodward 1921)

Harrison, B. 1904. *An outline of the history of the eolithic flint implements*. Ightham: The Author, 23 pp.

Harrison, B. (see also Harrison, E. R.)

Harrison, E. R. 1928. *Harrison of Ightham: a book about Benjamin Harrison, of Ightham, Kent, made up principally of extracts from his notebooks and correspondence*. London: Humphrey Milford, Oxford University Press, xvi, 395 pp. (Benjamin Harrison, 1837–1921, was the leading figure in the British eolithic movement during the last decade of the 19th century around whom there became established a band of disciples known as the Ightham Circle. 'The discovery in 1911 of the Piltdown skull was an event of great archaeological interest, and Harrison corresponded with Charles Dawson, the finder, concerning the geological position in which the bones were found, receiving from him samples of flints and gravel.' Harrison wrote the following letter to W. J. Lewis Abbott, on 17 May 1913: 'Martin came on Sunday last and I had a hurried look at the Geological Society's journal and just time to read the discussion on the Piltdown skull. When I carefully scanned the lithographs [of the supposed implements] I must confess that I had my doubts. To me most of them were meaningless. To-day there came a post card from Dawson stating that he was motoring around my area and would call. He came with a friend. Mr. Dawson produced a small flint and asked me, 'what do you think of this?' I could only say that nature had formed the hollow, and that there was no work of man upon it to prove that it was ever used by our ancestors. I then showed him my two best sets of eoliths: the 'pamphlet' set [Harrison 1904], and a strong group of hollow scrapers', p 303.)

Harrison, G. A. 1983. J. S. Weiner and the exposure of the Piltdown forgery. *Antiquity*, **57**, no. 219, 46–48. (Quotes remarks set down by Joe Weiner shortly before his death, correcting some misconceptions which appear to have grown up concerning the early stages in the exposure of the Piltdown forgery.)

Harrison, G. A. 1990. Hominid whodunnit. *Nature*, **348** (22 Nov), 369–370. (Review of Frank Spencer's *Piltdown Forgery* and *Piltdown Papers*. Reviewer is unconvinced by the argument concerning Arthur Keith's supposed involvement in the conspiracy and recounts the opinion of J. S. Weiner as expressed to him at the time.)

Harrison, G. A. 1992 (contribution to discussion in Tobias 1992c: 'This presentation contains little that is new. Essentially it says no more than that Tobias shares Langham's and Spencer's view that Sir Arthur Keith was involved in the perpetration of the Piltdown fraud. For me the case remains as weak as ever, and I find myself guilty of many of the sins that are used as evidence against Keith—failure to remember people I have once met, not having met people I should have met, confusion over dates and slips of the tongue and pen over events and semantics, delegation of authority for access to departmental material, selective destruction of correspondence, respect of confidences and loyalty to friends, unwillingness to invade people's privacy, and being disliked by at least some people. Thank goodness I wasn't around in 1912!')

Harrison, G. A. & Collins, K. 1982. In memoriam: Joseph Sydney Weiner (1915–1982). *Annals of Human Biology*, **9** (6), 583–592.

Harrison, G. A. (see also Miles, H. 2003)

Harrison, J. M. 1962. The Hastings Rarities. *The Times*, 15 Aug, 11. (A response to Anon. 1962. Harrison was personally acquainted with George Bristow, the taxidermist at the centre of the Hastings Rarities affair, and considers him to have been completely honest. See also Harrison 1968)

Harrison, J. M. 1968. *Bristow and the Hastings Rarities affair*. St. Leonards-on-Sea: A. H. Butler, 160 pp, 5 plates. (Examines the controversy which surrounded the claims of the late taxidermist, George Bristow, about the authenticity of rare species of birds found in Kent and Sussex in the late 19th and early 20th centuries. Harrison provides a strident defence of Bristow and rejects the idea that Bristow's perceived guilt is in any way confirmed by his association with Charles Dawson. See Russell 2003, 135–140, for a discussion of Dawson's supposed involvement in the affair, for which he can find no conclusive evidence. See also short discussion in Turrittin 2006, 12, where additional references are cited.)

Harrison, T. 1959. The Piltdown forgery: A. H. Everett and Niah. *Sarawak Museum Journal*, **9** (13/14), 147–150. (A. H. Everett's collection of sub-fossil orangutan specimens from the Niah caves of Sarawak were given to the Natural History Museum and catalogued by Smith Woodward in 1899. The suggestion is made that the collection could have been the source of the jaw used at Piltdown.)

Harrold, F. B. 1992 (contribution to discussion in Tobias 1992c: 'The circumstantial evidence so skilfully assembled and analyzed by Tobias (and by Spencer 1990) points to Arthur Keith as Charles Dawson's mystery accomplice more strongly than to any other candidate. Keith's uncharacteristic act of destroying all his correspondence with Dawson is particularly suspicious... It may be asked whether anthropologists should care about this ancient hoax...[but] as arguably the most successful fraud in the history of science, it is especially valuable as a case study of the factors influencing acceptance or rejection of scientific ideas... Many anti-evolutionists, called "scientific creationists," argue that the fossil and geological records are actually consistent with a literalistic interpretation of the creation account in Genesis. They are led by a cadre of writers and lecturers, some with advanced degrees in technological and scientific fields [e.g. Gish 1985], who attack numerous aspects of evolutionary science. Not surprisingly, paleoanthropology is one of their favourite targets, and Piltdown man is one of their weapons.' See Turrittin 2006, 10–11, for a brief résumé of pseudoscientific and anti-evolution literature in the context of Piltdown.)

Haward, F. N. 1912. The chipping of flints by natural agencies. *Proceedings of the Prehistoric Society of East Anglia*, **1** (2), 185–193, [9] plates. (Paper read 4 Dec 1911. The author demonstrates how flints of 'eolithic' type may be formed by natural processes. 'My imagination and antiquarian ideas prompt me to accept Eoliths as Man's work; for it seems improbable that the typical Palaeolithic implements of the Pleistocene deposits are the first. My reason, observation, and geological knowledge, however, make me doubt, and finally conclude that the vast majority of these meaningless chipped flints are the result of Nature's work and not Man's.' This paper was a counter argument to Moir 1912a, which preceded it.)

Haward, F. N. 1913. The problem of the eoliths. *Proceedings of the Prehistoric Society of East Anglia*, **1** (3), 347–359, plates LXXXI–XCI. (Discusses the experimental work on flint chipping by Warren and Moir, the mechanics of flint chipping, and the geological and stratigraphical position of eoliths. The writer notes that eoliths are found in association with palaeoliths on the Kent Plateau, yet W. H. Cook has pointed out that some of the palaeoliths from the plateau are much more rolled and of much deeper ochreous patina than the associated eoliths. 'In short, if the "Eoliths" are of Pliocene age, then the associated "old brown" and much-rolled Palaeoliths must be older still.'))

Hawkes, E. W. 1916. Skeletal measurements and observations of the Point Barrow Eskimo with comparisons with other Eskimo groups. *American Anthropologist*, **18** (2), 203–244. (In discussing the occurrence of a thirteenth thoracic vertebra in some individuals of the Inuit, the author notes that 'More recently Charles

Dawson has drawn attention to the frequency of extra vertebrae in the Eskimo', pp. 213-214. Since no source is given for this statement, it is likely that it derives from a report in *The New York Times* (Anon 1914b). The writer appears to have been unaware of the work of Le Double 1912, which may have been the springboard for Dawson's observations. See Dawson 1912.)

Hawkins, H. L. 1930. Pebbles of quartzite near Piltdown. *Geological Magazine*, **67** (1), 28–30. ('In July of 1929 I visited the classic locality of Piltdown under the guidance of Sir A. Smith Woodward. After paying homage at the tomb of *Eoanthropus* we descended from the plateau to the low-level gravel terrace that flanks the flood-plain of the River Ouse.' Here, in a new gravel pit at a place called Sharp's Bridge, at 38 ft above O.D., they found predominantly pebbles of more or less worn fragments of ironstone and ferruginous sandstone derived from the Wealden deposits. 'In addition to these, there occur occasionally brown-coated sub-angular flints, which agree so closely with those found in the *Eoanthropus* plateau (about 100 feet above) that it seems safe to assume their derivation from that source. To our great surprise we found associated with these expected constituents a not inconsiderable number of pebbles of quartzite and vein-quartz.'))

Haywood, I. 1987. *Faking it: art and the politics of forgery*. Brighton: Harvester Press, v, 154 pp. (Archaeological forgery and fictions of the first human, pp. 90–103: including a discussion of the Moulin-Quignon and Piltdown Man forgeries)

Head, J. O. 1971. Piltdown mystery. *New Scientist*, **49** (14 Jan), 86. (Letter prompted by a commentary in *New Scientist*, **48** (10 Dec), 471, which reported Louis Leakey's strong hint, as reported by the *Sunday Times*, that he believed the 'hoaxer' at Piltdown to have been Teilhard de Chardin. Mr Head recounts a conversation he had with Robert Essex, who knew both Dawson and Teilhard. 'One of Essex's points lay in his estimation of the personalities of the two men: Dawson being pompous, self-opinionated and unimaginative, far more likely to be the victim than perpetrator of such a hoax, whereas Teilhard was, as Leakey states, well known as a practical joker.')

Heal, V. 1980. Further light on Charles Dawson. *Antiquity*, **54** (Nov), no. 212, 222–225. (Presents evidence that casts doubt on the authenticity of several of Dawson's archaeological 'discoveries', notably a Neolithic flint hatchet in a wooden haft from East Dean and an ancient boat of clinker construction from Bexhill, neither of which was preserved. The author is a research student at Cambridge working on prehistoric wood technology in N.W. Europe. See also remarks by John H. Combridge 1981.)

Hedges, R. E. M., Housley, R. A., Law, I. A. & Bronk, C. R. 1989. Radiocarbon dates from the Oxford AMS system: Archaeometry Datalist 9. *Archaeometry*, **31**, 207–234. (See Spencer & Stringer 1989)

Heizer, R. F. & Cooke, S. F. 1954. Comments on the Piltdown remains. *American Anthropologist*, **56** (Feb), 92–94. (In the light of their experience in investigating and evaluating fluorine and other constituents of archaeological human and animal bone, the authors draw certain conclusions from the findings of Weiner, Oakley and Le Gros Clark, as reported in Washburn 1953. They would regard the jaw, molar and canine of Piltdown I and the molar of Piltdown II as of very recent origin. The fluorine content of the bones mentioned does not exceed the range found in fresh bone, while the values for nitrogen content (3.9–5.1%) all lie at or above the average value for fresh human and animal bone, which is about 4%. Even a relatively short period of interment of the order of 100 to 300 years, as shown by burials in culturally late California sites, reduces the nitrogen content rapidly to not higher than 3%. The Piltdown I skull, together with the frontal fragment of Piltdown II, all give indication of moderate age. On the other hand, the fluorine and nitrogen values for the occipital fragment of Piltdown II are conflicting and imply one of three possibilities: (1) a modern bone introduced as a hoax; (2) an archaeological specimen removed from its original site elsewhere and introduced to the Piltdown locality, or (3) an indigenous bone in the Piltdown gravels.)

Henderson, M. 2003. Piltdown hoax hunt narrows to two men. *The Times*, 6 Sept, 15. (New research on the Piltdown fraud, conducted by experts at the Natural History Museum, has narrowed the list of suspects from 27 names to just two men, Charles Dawson and Martin Hinton. Fresh analysis of the suspects' correspondence, and the circumstances of the find, has revealed that only Dawson and Hinton had the opportunity, motive and means to have perpetrated the fraud. Prof Chris Stringer, Head of Human Origins at the NHM, will be presenting his case at the museum's Pfizer Annual Science Forum, which this year commemorates the fiftieth anniversary of the fraud's exposure. Stringer is inclined to accept Dawson as the sole forger, although Hinton's involvement cannot at this stage be excluded.)

Henneberg, M., Eckhardt, R. B. & Schofield, J. 2011. *The Hobbit trap: how new species are invented*. 2nd ed. Walnut Creek, California: Left Coast Press, xii, 215 pp. (First published in 2008 as *The Hobbit trap: money, fame, science and the discovery of a 'new species'*. The book challenges the claims of Prof.

Mike Morwood, an Australian archaeologist, to have discovered a new species of dwarfish human, *Homo floresiensis*, on the island of Flores in Indonesia. Excavated in 2004, and cannily nicknamed the ‘Hobbit’, this wholly unexpected species was stated to be only about 18,000 years old. While some scholars were quick to accept the validity of *Homo floresiensis*, the present writers have good reason to believe that the ‘fossil’ is a comparatively modern *Homo sapiens* suffering from a well known genetic abnormality of the skull. The suggestion is also made that the Hobbit’s left lower first molar appears to have been drilled and subjected to modern dental work during its lifetime! Access to the remains in order to verify this point has for some time been denied. The authors end their book with the plea: ‘We hope this debate will not end the way the argument over Piltdown Man did. The truth – and the molar – are still out there.’)

Hewitt, H. D. 1955. List of objects found in the Lavant Caves, 1893-4; excavated by C. Dawson & J. Lewis; formerly at Goodwood House, and now (1955) in Chichester Guildhall. Typescript document, 2 leaves of foolscap, among the papers of R. L. Downes archived at the Sussex Archaeological Society, Lewes. (This record was made 5 April 1955, presumably at the instigation of Downes, who was investigating Dawson’s activities at this time. Fifty-one objects are recorded from their label descriptions, with remarks and comments by H. Dixon Hewitt. The list is reproduced as Appendix I in Russell 2003, 271–272.)

Hewitt, J. T. 1898. Note on natural gas at Heathfield Station (Sussex). *Quarterly Journal of the Geological Society of London*, **54** (3) Aug, 572–574 (with discuss). (See herein Dawson 1898b for comments)

Hewitt, J. T. (for an obituary see Turner 1955; Costello 1986 has implicated Hewitt in the Piltdown forgery; see also Daniel 1986)

Hicks, C. 2006. *The Bayeux Tapestry: the life story of a masterpiece*. London: Chatto & Windus, x, 358 pp, [8] pp of plates. (While researching the Bayeux Tapestry for his *History of Hastings Castle*, Charles Dawson became aware of the many discrepancies between the visual and written records of the battle, and, equally significantly, between earlier and later recordings of the Tapestry itself. This inspired him to publish two articles (Dawson 1907a, 1909a) in which he attacked the earlier interventions and restorations. Among other things he noted that in the 18th-century engraving of the Tapestry published by Bernard de Montfaucon, the ‘arrow in the eye’ appears as a spear shaft above the helmet, but a later restoration had changed its angle and added the feathers. This perceptive observation was eventually confirmed in 1983 when the back of the Tapestry was examined. Hicks concludes that ‘Dawson’s work on the Tapestry was an attempt to win the respect of experts by challenging them. By exploring its inconsistencies and drawing attention to its allegedly fraudulent restorations, he was trying to show that an amateur scholar could outdo the professionals. The Piltdown affair was simply an extension of this process’; see pp 292–4)

Highfield, R. 1996. Old canvas trunk holds identity of Piltdown hoaxer. *Daily Telegraph*, 23 May, 9. (Concerns the evidence of Gardiner & Currant 1996 which is to be presented at a meeting of the Linnean Society on 24 May, in which they identify Martin Hinton ‘unequivocally as the person who planted the hoax. His motive was to embarrass Prof Arthur Smith Woodward...’ Hinton is described as a ‘charming eccentric with a passion for pranks.’ This report appears to derive in part from Gee 1996.)

Highfield, R. 1997. The mysterious case of Conan Doyle and Piltdown Man. *Daily Telegraph*, 20 Mar, 3. (‘Today, at a debate staged by the Linnean Society as part of National Science Week, Richard Milner, a historian of science from the American Museum of Natural History will offer evidence that Arthur Conan Doyle, the creator of Sherlock Holmes, was responsible [for the Piltdown forgery]... And he seems to have left many clues that he had carried out the hoax in his classic dinosaur adventure, *The Lost World*, published in 1912. Although Sir Arthur was first implicated 15 years ago, Mr Milner says that the evidence of his involvement has strengthened. The book describes a bone shaped like a cricket bat... The main character in the adventure, Prof Challenger, is Sir Arthur’s alter ego [the frontispiece to the first edition is a photograph of the expedition team with Conan Doyle himself disguised as Challenger]... and another character says that faking bones is as easy as faking photographs. A map of the caves, a puzzle containing 18 characters, that enable the fictional characters to escape from the lost world may offer another clue. One solution proposed is that the 18 characters correspond to the holes on the Piltdown Golf Course [said to be frequented by Doyle]. “This would give a new meaning to the phrase missing links,” he said. “But I rather think it is a cryptogram, not a map.”’ On this last point see also Gornall 2003.)

Hilber, V. 1915. Irrige Beziehungen zwischen Eoanthropus, Pithecanthropus, Heidelberger und Neandertaler Mensch. *Zeitschrift für Morphologie und Anthropologie*, **17**, 503–504.

Hill-Tout, C. 1921. The phylogeny of Man from a new angle. *Transactions of the Royal Society of Canada*, ser. 3, **15**, sect. II, 47–82. (Piltdown man, pp. 74–78. The writer does not concur with G. S. Miller's argument for disassociating the Piltdown cranium and mandible, but sees in *Eoanthropus* 'a true and typical Dawn-man'.)

Hillaby, J. 1973. Who was the Piltdown Mephisto? *New Scientist*, **57** (15 Mar), 619–620. (The writer has spent much time talking to people associated in one way or another with the Piltdown affair. He is highly critical of Francis Vere, who is cagey about allowing authors to quote from his works, fails to justify apparent contradictions from those he quotes (such as Mabel Kenward of Piltdown and L. F. Salzmann of the Sussex Archaeological Society), considers Dawson to be an expert geologist and archaeologist in one chapter and a clumsy amateur in another, and so on. Teilhard is cryptically referred to as 'Mephisto', and the writer asks if 'Weiner could now say plainly whether, in his opinion, Teilhard is or is not that "remarkably shadowy figure" Mephisto.' Weiner (1973a) did indeed reply. Hillaby had previously contributed a feature on the Piltdown exposure to the *New York Times* on 22 Nov 1953, which included comments from E. A. Hooton.)

Hinton, M. A. C. 1926. The Pleistocene Mammalia of the British Isles and their bearing upon the date of the Glacial period. *Proceedings of the Yorkshire Geological Society*, **20** (3), 325–348. (Notes, p. 334, 'that the famous deposit at Piltdown occupies a very similar position, in relation to its local stream, to that occupied by the High Terrace in relation to the Thames. At Piltdown, in my opinion, we see dim indications of what the fauna of the South of England was in the earliest part of the High Terrace stage... *Eoanthropus* himself is surely as primitive a mammal as one could wish to find in a post-glacial deposit; too primitive probably to be associated with Chellean implements, but possibly responsible for the Eoliths. *Mastodon* takes us back to Norwich Crag times; the primitive elephant *Stegodon* to an even older, perhaps middle, Pliocene horizon (if we were to judge the case by the Indian standards), while *Hippopotamus*, red deer, horse, and beaver of recent European type, can all be matched in Cromerian deposits.')

Hinton, M. A. C. 1953. Piltdown Man forgery: investigators' access to fragments. *The Times*, 4 Dec, 2. (Claims, with only partial justification (see Spencer 1990b, 227–8), that fraud would have been suspected sooner had researchers been permitted to handle original specimens from Piltdown, rather than casts—Hinton himself, who worked at the Natural History Museum, had never been permitted to handle original material. Spencer quotes a letter from Hinton to J. S. Weiner, dated 11 May 1955, in which he states that 'from the beginning I was sure a false association had been made by Smith Woodward – he had lined up the jaw of a chimpanzee (I still regard it as that and not Gorilla) with a human skull... I think the original discovery of the skull by the workmen was very likely genuine – but the rest was a practical joke which succeeded only too well...')

Hinton, M. A. C. & Kennard, A. S. 1905. The relative ages of the stone implements of the Lower Thames Valley. *Proceedings of the Geologists' Association*, **19** (2), 76–100, plate I. (The authors endeavour to show that it is possible to divide the history of the Lower Thames Valley into several stages, which can be used in the classification of flint implements. Though 'such a scheme can only be local in its application, yet it is possible that a correlation may be made with the implementiferous beds of other river systems...')

Hinton, M. A. C. (see Savage 1963 for obituary. For a discussion of Hinton as a suspect in the Piltdown forgery see Turrill 2006, 19–22.)

Hirschson, N. 1992. More views on the Piltdown saga. *Adler Museum Bulletin*, **18** (2), 23–25. (A contribution to the discussion concerning the assertions of Tobias 1991, 1992b against Arthur Keith. See Tobias 1992d for reply.)

Holden, E. W. 1980a. An echo of Piltdown. *Sussex Archaeological Society Newsletter*, no. 30 (Apr), 201. (Recounts the strange story of ape-like man resident at Fletching, near Piltdown, in the first half of the 19th century, who was kept chained up by his mother. He appears to have died in the 1860s, but, being regarded as a soulless monster, could not be buried in hallowed ground. It was thought he might have been buried quietly at Piltdown because old horses had been interred there. The implication was that Piltdown Man might be this unfortunate individual. The story was told by an old inhabitant to E. Cecil Curwen in Jan 1954, shortly after news of the Piltdown fraud was made public.)

Holden, E. W. 1980b. The photographic survey of Sussex. *Sussex Archaeological Society Newsletter*, no. 32 (Dec), 215–216. (Photographs, negatives and slides acquired by the Sussex Archaeological Society during 1903–04 in connection with a photographic survey of Sussex had to be transferred to Brighton Reference Library because of Charles Dawson's 'unexpected' acquisition in 1903 of the Society's headquarters at Castle Lodge, Lewes. The Society was obliged to move to temporary accommodation at 35 High Street, where there was insufficient storage space. 'The late Dr. L. F. Salzman once told the writer that, because of

Dawson's somewhat questionable conduct concerning the purchase of Castle Lodge, the Society ignored his 'discoveries' at Piltdown a few years later.' See comments from Houghton 1981b. See also Salzman 1946)

Holden, E. W. 1981. The Lavant Caves. *Sussex Archaeological Society Newsletter*, no. 34 (Aug), 244. (As an added note to McCann 1981, an extract is quoted from an article which appeared in the *Sunday Times*, 16 Jan 1955 (Emerson & Weiner), where it is stated that an 'accusation of unreliability was later made of Dawson's work in connection with the excavation of the Lavant Caves. From this source he had produced some finds which had struck everyone as very singular. A later investigator [presumably Allcroft 1916] attempting to verify and interpret these curious discoveries, alleged, with irritation, that the records of the work were imprecise to the point of being virtually useless.' This note prompted a comment by Houghton 1981.)

Holliday, R. & Williams, P. 1978. Professor is named as Piltdown hoaxer. *Sunday Telegraph*, 29 Oct, front & back pages. (The *Sunday Telegraph* appears to have been the first newspaper to publish Beverley Halstead's presentation of Prof. James Douglas's 'evidence' implicating Prof. W. J. Sollas as co-conspirator with Dawson in the Piltdown fraud. Douglas's assertion is contained in a 20-minute tape recording, parts of which are here quoted, together with remarks from Richard Ford, an amateur palaeontologist who prompted Douglas to make the recording. Douglas died on 27 Feb 1978. See Halstead 1978a. *The Daily Telegraph* also ran a feature the following day by R. B. O'Brien entitled "'Brains' behind Piltdown Man hoax is named'.)

Hooton, E. A. 1916. The evolution of the human face and its relation to head form. *Dental Cosmos*, **58**, 272–281. (*Eoanthropus*, pp. 277–278. Ernest Albert Hooton, an American, supported Smith Woodward's interpretation of Piltdown man. He had studied at Oxford (1910–13) and had come under the influence of Arthur Keith. 'Indeed Hooton's ideas of human evolution developed closely along the lines of those espoused by Keith.' From Spencer 1990b, 215.)

Hooton, E. A. 1931. *Up from the ape*. New York: Macmillan, xvii, 626 pp. (Dame Eoanthropus: the first female intellectual, pp. 302–314; a detailed analysis of the skull and jaw of the 'Piltdown lady', the integrity of which is not doubted by the writer, who was Professor of Anthropology at Harvard University.)

Hooton, E. A. 1954. Comments on the Piltdown affair. *American Anthropologist*, **56** (Apr), 287–289. (Expresses reservations about the accuracy of the tests undertaken by Oakley and his team. He had written to Arthur Keith on 20 December 1953 (Spencer 1990b, 215) in the following terms: 'I am sure that you must have found the Piltdown business distressing and tragic, as I have. It is more difficult for me to believe that Sir Arthur Smith Woodward or Dawson would have perpetrated a fraud than believe that an apelike jaw goes with a human brain-case. In fact I refuse to believe it (the fraud) as far as Woodward at least is concerned. I never knew Dawson... The whole thing has a most disastrous effect in destroying public confidence in the integrity of science and has been seized upon by the anti-evolutionists...')

Hooton, E. A. (for an obituary see Shapiro 1981)

Hopwood, A. T. 1935. Fossil elephants and man. *Proceedings of the Geologists' Association*, **46** (1), 46–60. (Piltdown, pp. 47–51: the writer has made a fresh examination of the Piltdown mammalian fauna and believes that the human remains, judged purely on their state of preservation, more properly belong with that part of the assemblage which has been assigned to the Pliocene and includes *Mastodon* and *Elephas* cf. *planifrons*.)

Hopwood, A. T. (see also Osborn 1942)

Horst, M. 1921. Ein zweiter "Halbmenschen"-Fund von Piltdown. *Neuw Weltanschauung*, **10**, 72–77.

Hoskins, C. R. & Fryd, C. F. M. 1955. The determination of fluorine in Piltdown and related fossils. *Journal of Applied Chemistry*, **5** (Feb), 85–87.

Hoskins, C. R. (see also under Oakley)

Houghton, J. 1981a. The Lavant Caves. *Sussex Archaeological Society Newsletter*, no. 35 (Dec), 253. (Brief response to a note by Holden 1981, who queried the value of Charles Dawson's report on the Lavant Caves in the light of remarks by Emerson & Weiner 1955b. Unfortunately the writer's claim that L. F. Salzman 1955b branded these remarks as 'completely untrue' relates not to the Lavant Caves but to the Castle Lodge affair. Houghton's contribution can therefore be dismissed.)

Houghton, J. 1981b. Castle Lodge Lewes. *Sussex Archaeological Society Newsletter*, no. 35 (Dec), 257. (A reaction to Holden 1980b. Presents evidence that contests the oft-repeated claim that Dawson acquired Castle Lodge by underhand means.)

Howard, P. 1974. History is lies—ask the Piltdown Man. *The Times*, 30 Mar, 14. (Article prompted by the findings of Lieutenant-Colonel P. B. S. Andrews of Maresfield Park, who has shown that a purported historical map of the Maresfield Forge, credited to Charles Dawson, is a forgery. The article is based on an interview with Andrews which led to the publication of a fuller account in the *Sussex Archaeological Collections* for 1974, although Andrews had died by the time of its appearance. *The Times* article prompted reactions from Steer 1974, Scheuer 1974a, Kermack 1974, Daniel 1974, Scheuer 1974b, Weiner 1974, and Ball 1974)

Howells, W. W. 1947. *Mankind so far*. New York: Doubleday & Co. Inc. (American Museum of Natural History, Science Series, vol. 5), xii, 310 pp, 6 plates. (Considers that the evidence in regard to Piltdown Man has become so confused that no definite decision can be advanced concerning its status. First published 1944. Not seen)

Howells, W. W. 1959. *Mankind in the making: the story of human evolution*. New York: Doubleday & Co. Inc, 382 pp, 8 plates. (With a chapter on 'Piltdown Man: his rise and fall', pp. 243–257, which is a detailed review of the history of the discovery, its effect on ideas about human origins, and the manner in which it was exposed as a fraud. Howells concludes that 'The real moral of the story has nothing to do with the ethics of man. Rather, it points to the progress of science. Some of my colleagues feel that the whole affair was a tragic waste of time. I do not agree, although it was indeed an injury to Smith Woodward, who spent many of his later years in fruitless further search. Under totally false colors, Piltdown Man created great interest in ancient man and problems related to him. He was largely responsible for Keith's important work, *The Antiquity of Man*, and was a constant spur to thinking, which is not wasted time even if a lot of the answers are wrong. More than that. The Piltdown business was carried out as a fraud. But if it had been done as a test, to measure the reality of the advances in knowledge of fossil man, it could not have been better devised. The anthropologists were were fooled by *Eoanthropus* for a long time [although not all of them], since they accepted the apparent evidence of nature, and were playing according to the rules. Because of this, it eventually became clear that *Eoanthropus* himself was not playing the rules. And because of the outcome, we can see the soundness of the rest of our knowledge, and the importance of certain principles. The falsity of Piltdown Man does not cast a shadow on Swanscombe Man, for example; quite the reverse. And we can see how significant is our understanding of the australopithecines, since this was such a factor in forcing the exposure of Piltdown. At the same time, we are reminded of the supreme importance of having exact information about dates, whether from careful geology, or from tests like the F test, or from reliable animal associations.' From Piltdown Plot Project website.)

Howells, W. W. 1981. Franz Weidenreich, 1873–1948. *American Journal of Physical Anthropology*, **56** (4), 407–410.

Howgate, M. 2004. The unlikely story of Miocene Man. In: *Geofakes, frauds and hoaxes*, abstracts of a meeting organised by the History of Geology Group, under the aegis of the Geological Society of London, Burlington House, London, 22 October 2004, p. 4. ('In 1806 a fossilised human skeleton was excavated by the French on the West Indian island of Guadeloupe. Shortly after, British troops took the island, and the skeleton was presented to the British Museum in 1812. Following several years on display it was relegated to the store of the Natural History Museum in 1967. There it quietly remained until 1983 when a flurry of letters arrived at the museum's palaeoanthropology department accusing the museum of 'deliberate concealment of evidence' and 'downright dishonesty.' The skeleton was claimed to be direct evidence of the Noachian deluge and proof that modern humans existed in the 'Miocene.' The skeleton became the centre of a long running battle between museum scientists, 'APEmen' and two rival factions of British Creationism.' Full text.)

Hrdlička, A. 1914. The most ancient skeletal remains of man. *Annual Report of the Smithsonian Institution*, for 1913, 491–552, 41 plates. (The "Eoanthropus Dawsoni", pp. 501–509, plates 5–8, being a summary of published findings. At the time of writing, Hrdlička had been unable to examine any of the Piltdown material at first hand and thus could offer no original observations.)

Hrdlička, A. 1916. *The most ancient skeletal remains of man*. 2nd ed. Washington: Smithsonian Institution, Publication no. 2300, 63 pp. (Not seen)

Hrdlička, A. 1922. The Piltdown jaw. *American Journal of Physical Anthropology*, **5** (4), 337–347. (During a recent visit to London the writer was able to undertake a close and lengthy examination of the Piltdown jaw and skull. He was struck by a strong feeling of incongruity and lack of relationship between the two parts. 'To connect the shapely, wholly normal Piltdown jaw with the gross, heavy Piltdown skull into the same individual seems very difficult. After prolonged handling of both the jaw and the skull there remained in

the writer a strong impression that the two may not belong together, or that if they do the case is totally exceptional.' He concludes however that the jaw is not that of a chimpanzee, as argued by his American colleagues, but of a human precursor or very early man.)

Hrdlička, A. 1923. Dimensions of the first and second lower molars, with their bearing on the Piltdown jaw and on man's phylogeny. *American Journal of Physical Anthropology*, **6** (2), 195–216. (Concludes that 'the Piltdown teeth, primitive as they are in some respects, are already human or close to human.')

Hrdlička, A. 1924. New data on the teeth of early man and certain fossil European apes. *American Journal of Physical Anthropology*, **7** (1), 109–132, plate. (*Eoanthropus*, pp. 118–122. Not seen.)

Hrdlička, A. 1930. The skeletal remains of early man. *Smithsonian Miscellaneous Collections*, **83**, 379 pp, 93 plates. (Including a highly critical review of the Piltdown discoveries, pp. 65–90, plates XIII–XIV. The writer reinforces the incongruity that exists between the jaw and skull. He concludes that '...it must be plain that any far-fetched deductions from the Piltdown materials are not justified. This applies particularly to the superficially attractive conclusions that the Piltdown remains demonstrate the existence in the early Pleistocene, long before the Neanderthal and even the Heidelberg forms, of men with practically modern-sized and modern-formed skulls and brains and directly ancestral to *Homo sapiens* or recent man. This hypothesis is a proposition that would change the whole face and trend of human prehistory, and that against all other and better substantiated evidence in this line.')

Hrdlička, A. (for an account of the life and career of Aleš Hrdlička, see Spencer 1979)

Hunter, J. I. 1924? New light on the controversy of the Piltdown jaw and cranium. Summary address before the Society of Dental Science, New South Wales, pp. 1–11. (Cited in Quenstedt 1936)

Hunter, J. I. (see Smith & Hunter 1925)

Huxley, T. H. 1863. *Evidence as to man's place in nature*. London: Williams and Norgate, [8], 159 pp; New York: D. Appleton & Company, 184 pp. (Ch. III. On some fossil remains of man, pp. 119–159 (139–184 in American edition), in which he discusses the finds from Engis and Neanderthal, and provides translations of extracts from the accounts of Schmerling 1833 (1833–34) and Schaffhausen 1858 (from Busk 1861). He notes that after comparing the Neanderthal cranium with many others, ancient and modern, Professor Schaffhausen concludes that "...the human bones and cranium from the Neanderthal exceed all the rest in those peculiarities of conformation which lead to the conclusion of their belonging to a barbarous and savage race." Huxley's assessment of the Neanderthal cranium, based on a study of the cast and on photographs and comments kindly provided by the discoverer, Dr Fuhlrott, leads him to conclude that it has several 'ape-like characters, stamping it as the most pithecoïd of human crania yet discovered.' Yet its brain would appear to have been relatively large, while the proportions of the limbs are quite like those of a European of middle stature. 'In no sense, then, can the Neanderthal bones be regarded as the remains of a human being intermediate between Men and Apes... Where, then, must we look for primæval Man? Was the oldest *Homo sapiens* pliocene or miocene, or yet more ancient? In still older strata do the fossilized bones of an Ape more anthropoid, or a Man more pithecoïd, than any yet known await the researches of some unborn palaeontologist?')

Illingworth, L. G. 1953. Collapse of 600,000-year-old party. *Punch*, 2 Dec, 653. (Includes a cartoon with the caption: "This may hurt, but I'm afraid I'll have to remove the whole jaw." The cartoon, which shows an ape in a dentist's chair with Alvan Marston about to operate, was inspired by Marston's outburst at a meeting of the Geological Society on 25 Nov, but probably derives its theme from a humorous 'Notice of Operation' that was circulated by Marston in 1936 prior to a meeting at the Royal Society of Medicine where he put forward his argument for disassociating the Piltdown jaw and skull. For background to this see Turrill 2004, who reproduces the cartoon, as does Spencer 1990a, frontispiece, and Blinderman 1986, 80.)

Irving, A. 1913. The Piltdown horse "grinder." *Nature*, **91** (28 Aug), 661. (Identifies a horse premolar from the Piltdown site as *Equus robustus*, implying a date for the Piltdown gravel far younger than Pliocene. The writer came to his conclusion after examining the original specimen at the Natural History Museum.)

Irving, A. 1914a. The Piltdown skull. *Morning Post*, Jan.

Irving, A. 1914b. Some recent work on later Quaternary geology and anthropology, with its bearing on the question of "pre-boulder-clay man." *Journal of the Royal Anthropological Institute*, **4** (July–Dec), 385–393. ('The hominid *Eoanthropus dawsoni* (Piltdown) is undoubtedly of pre-chalky boulder-clay age', i.e. pre-Anglian ice age, p. 393. From Miller 1915.)

Jahn, M. E. & Woolf, D. J. 1963. *The lying stones of Dr. Johann Bartholomew Adam Beringer; being his Lithographiæ Wirceburgensis*. Berkeley: University of California Press, xiv, 221 pp, [24] pp. of plates. (The *Lithographiæ Wirceburgensis*, published in 1726, was the result of one of the most famous hoaxes in the history of science. Envious enemies of Dr Beringer, an assiduous German ‘virtuoso’ and physician, intent on provoking the learned doctor into exposable error, carved curious fossil shapes into stone and buried them on a mountain near Würzburg. Here they were ‘discovered’ and brought to the attention of Beringer, who published a detailed account of them. Not long after the publication of his learned treatise the hapless Beringer found his own name among the rocks, carved in Hebrew. Legend has it that Beringer, realising the deception, attempted to buy back all the copies of his recently published book, ruined himself financially, and shortly died of chagrin and mortification—the prank of some heartless students having succeeded all too well. In fact, he identified the culprits and brought legal proceedings against them. His so-called fossils, many of which still survive, were dubbed ‘Lügensteine’, or ‘lying stones’.)

Jefferson, E. A. R. (concerning the Sherborne engraved bone: see under Steel 1926)

Jenkins, W. D. 1987. Has anything escaped me? *Baker Street Miscellanea*, no. 49, 28–34. (This was evidently prompted by Blinderman’s book *The Piltdown Inquest*, 1986. See Turrington 2006, 18)

Joel, C. E. 1982. The Piltdown let down. *Popular Archaeology*, 4 (2), 4. (Response to Clements 1982)

Johnston, H. H. 1916. Reviews: Men of the Old Stone Age: Their Environment, Life and Art.— Henry Fairfield Osborn. *Geographical Journal*, 48 (4) Oct, 349–350. (Particularly focuses on Osborn’s views concerning Piltdown, and regards his acceptance of Gerrit Miller’s attribution of the jaw to that of an ancient species of chimpanzee as ‘the only weak point in the work under review.’)

Johnstone, P. 1957. *Buried treasure*. London: Phoenix House, 111 pp, 67 plates. (Tells the story of a BBC television series hosted by Glyn Daniel, which included a half-hour feature on Piltdown Man, aired on 30 May 1955. Not seen)

Jones, M., Craddock, P. & Barker, N. (eds) 1990. *Fake? The art of deception*. London: British Museum Publications, 312 pp. (Including Piltdown, pp. 93–96. See under Craddock)

Keith, A. 1911a. The early history of the Gibraltar cranium. *Nature*, 87 (7 Sept), 313–314. (‘The Gibraltar cranium is generally regarded by anthropologists as one of the most important discoveries yet made of the Neanderthal type of man. Unfortunately its early history is imperfectly known. The two following letters help to make good this deficiency.’ The first letter records that a Lieut. Flint presented the skull to the Gibraltar Scientific Society on 3 Mar 1848. The second letter, dated 27 Aug 1864, is from Hugh Falconer to George Busk, and records that Falconer had considered naming the skull *Homo* var. *calpicus*, though at the end of his humorous letter he labels it, among other things, ‘wild homo calpicus of Gibraltar’. No such recommendation appears to have been made when the find was presented to the British Association in Sept 1864: see Busk 1865.)

Keith, A. Dec 1911b. *Ancient types of man*. London: Harper & Brothers, xix, 151 pp. (Introductory: pp. xi–xiii, ‘Whether or not we have found the remains of Pliocene man is a question still open to debate...’; Ch. IV. The Galley Hill man: the oldest human remains yet found in England, pp. 28–45, may have ‘belonged to the last of the temperate intervals which lie within the Ice Age’; Ch. IX. Heidelberg man, pp. 78–93, ‘From the Heidelberg jaw we learn that the human mechanism of mastication was fully evolved at the beginning of the Pleistocene Period. The canine teeth which are so large and prominent in all forms of anthropoids have in the Heidelberg specimen subsided to the level of the neighbouring teeth in the dental series. We must assume that at one period in the evolution of Man the canines were prominent and pointed as in the anthropoids...’; Ch. XI. Neanderthal man, pp. 101–108; Ch. XII. Neanderthal man in Belgium and France, pp. 109–120; Ch. XIII. Gibraltar man, pp. 121–130; Ch. XIV. The fossil man of Java—*Pithecanthropus erectus*, pp. 131–140, here assigned to the early Pliocene and renamed by Keith *Homo javanensis* in his usual cavalier fashion, and in complete disregard of the Rules of Zoological Nomenclature.)

Keith, A. 1912a. Description of the Ipswich skeleton. *Proceedings of the Prehistoric Society of East Anglia*, 1 (2), 203–209, [3] plates. (Paper read 21 Feb 1912. An anatomical description of the discovery described in Moir 1912b. ‘Assuming that Mr. Moir and I are right in regarding this skeleton as representative of pre-boulder clay man, then it is a most interesting fact to find that the modern type of man—with the exception of certain features of the leg bones—was evolved at this early date, for we are dealing with a period which antedates by a long interval the Mousterian period when Neanderthal man flourished in France and Belgium.’ See Moir & Keith 1912 for a more detailed analysis of the skeleton. It was this discovery, along with Keith’s reassessment

of the Galley Hill find (Keith 1911b), which helped to reinforce Keith's developing view that there had been two parallel forms of humanity during the Pleistocene, one leading to modern man, the other to Neanderthal. He also now believed that anatomically modern man must have appeared much earlier than was generally admitted.)

Keith, A. 1912b (see Keith 1913a)

[**Keith, A.**] 1912c. Discovery of a new type of fossil man. *British Medical Journal*, 21 Dec, 1719–1720. (On the evidence of Keith's personal diary it would appear that this anonymous review of the formal presentation of the Piltdown discovery at the Geological Society on 18 Dec was written by him two days before the meeting and derives in part from his personal examination of the material at the Natural History Museum early in December. He is critical of Smith Woodward's interpretation of the Piltdown teeth. See Spencer 1990a, 188–190 etc, & Walsh 1996, 151–153, 243 etc, for quoted passages, discussion and differing interpretation; Walsh 1996, 227, quotes Keith's diary in respect of two visits undertaken to examine the Piltdown material at the NHM on 2 & 15 Dec.)

Keith, A. 1912d (contribution to discussion in Dawson & Woodward 1912: 'Prof. A. Keith regarded the discovery of fossil human remains just announced as by far the most important ever made in England, and of equal, if not greater consequence than any other discovery yet made, either at home or abroad.' He agrees that the skull has been skilfully reconstructed but is concerned that the jaw has been made to look too much like that of a chimpanzee. The primitive characters of the skull and brain seem to him incompatible with the Chellean age assigned by the authors, and the skull should be assigned to the Pliocene, as indicated by the mammalian remains. In his opinion 'Tertiary man had thus been discovered in Sussex.' Presented 18 Dec.)

[**Keith, A.**] 1912e. The discovery of ancient man in Sussex. *British Medical Journal*, 28 Dec, 1762–1764.

Keith, A. 1913a. Modern problems relating to the antiquity of man. *Report of the British Association for the Advancement of Science*, Dundee, 1912, 753–759. (Keith begins by noting Boyd Dawkins' contention that the dawn of man occurred in the Pleistocene, which W. J. Sollas dates at some 400,000 years ago. 'Human workmanship becomes cruder as we approach the commencement of the Pleistocene. The stones which have been wrought by man's hand (Eoliths) become then more difficult to distinguish from those which have been shaped by natural forces.' Louis Rutot in Belgium claims he can trace an eolithic culture back beyond the Pleistocene into the Pliocene, Miocene and even into the Oligocene, which might be dated at 3 million years. The late Joseph Prestwich believed that the eoliths of Kent were of Pliocene age, yet many authorities reject eoliths as evidence of man's handiwork. On the basis that anthropoid apes had appeared by the middle of the Miocene, Keith argues that primitive man could have evolved at the same period, or at the very latest during the early part of the Pliocene. In speaking of the evidence for early man in England he states that 'It is a mystery why Neanderthal remains have not been discovered in England; they ought to be found, and a rumour is now current that they have been found.' Keith had possibly heard rumour of the discoveries at Piltdown, but evidently had no details. He presented his paper on 9 Sept 1912.)

[**Keith, A.**] 1913b. Piltdown: where the most ancient skull in the world was found. *The Sphere*, **53** (18 Jan), 76. (Keith's choice of anonymity in publishing this account of a visit to Piltdown, which can be linked to an entry dated Sunday 5 Jan 1913 in his personal diary recording a visit undertaken with his wife Celia on the previous day, was treated by Langham and Spencer as suspicious. See Spencer 1990a, 190–191 etc, & Walsh 1996, 153–155, 159–161, 244, for quoted passages, discussion and differing interpretation. Another anonymous contribution (Keith 1912c) was likewise used by Langham/Spencer/Tobias to support their case for Keith's complicity in the forgery. R. V. S. Wright 1992 interprets the diary entry differently.)

Keith, A. 1913c. The Piltdown skull. *The Times*, 14 Aug, 4. (A defence of his renaming of *Eoanthropus dawsoni* as *Homo piltdownensis*, in response to a criticism from F. A. Bather in *The Times*, 13 Aug, which pointed out that such an action was a contravention of the International Rules of Zoological Nomenclature. The criticism was prompted by Keith's lecture to the International Congress of Medicine, which took place at the Royal College of Surgeons on 11 August (see Anon. 1913f), where he presented his own restoration of the Piltdown skull re-labelled as *Homo piltdownensis*. Keith's defence prompted a light-hearted response in the *Daily Express* on 15 Aug, signed 'Eoanthropus dawsoni' but determined by Spencer (1990a, 68; 1990b, 76–78) to be from the hand of Charles Dawson.)

Keith, A. 1913d. Ape-man or modern man? The two Piltdown skull reconstructions. *Illustrated London News*, **143**, 16 Aug, 245. (A criticism of Smith Woodward's interpretation and restoration of the Piltdown skull. Keith presents his own reconstruction of the jaw, modelled by J. L. Williams, with a more human dentition.)

Keith, A. 1913e. Ape-man or modern man? The two Piltdown skull reconstructions: the case for Professor Arthur Keith's reconstruction. *Illustrated London News*, **143**, 23 Aug, 282. (See also Pycraft 1913)

Keith, A. 1913f. Our most ancient relation. *The Sphere*, **53** (Sept), 811. (Not seen)

Keith, A. 1913g. Present problems relating to the origin of modern races. *Lancet*, **2**, 1050–1053. (Report of Keith's opening address for the beginning of the Winter Session in Medicine at University of Birmingham on 7 Oct, in which he touched on Piltdown man and other English finds.)

Keith, A. 1913h. The Piltdown skull and brain cast. *Nature*, **92** (16 Oct), 197–199; (6 Nov), 292; (20 Nov), 345–346. (A criticism of Smith Woodward's restoration, which prompted some heated exchanges with Elliot Smith; see Smith 1913c)

Keith, A. 1913i (contribution to discussion in Dawson & Woodward 1913b: Keith admits difficulties in associating jaw, skull and canine as parts of one individual, but regards all as representing one species. He considers as problematic the presence of a pointed projecting canine, which moreover is much worn (indicating a mature adult), whereas the third molar tooth, according to the published X-ray by Underwood 1913a, is not completely erupted (indicating youth). See response on this point by Underwood 1913b. He sees no difficulty in regarding the lowest stratum in the Piltdown gravel, from which the human remains were recovered, as Pliocene in age. 17 Dec.)

Keith, A. 1913j (see Dawkins 1913b)

Keith, A. 1913k. Problems relating to the teeth of the earlier forms of prehistoric man. *Proceedings of the Royal Society of Medicine*, **6** (odontol sect), 103–124 (with discuss). (Piltdown mandible, pp. 116–119)

Keith, A. 1914a. The significance of the discovery at Piltdown. *Bedrock: A Quarterly Journal of Scientific Thought*, **2** (Jan), 435–453. (Considers that the remains found at Piltdown represent a form of man living in the later part of the Pliocene period; that speech was not possible with such a conformation of jaw and tongue; that, on the whole, the evidence is in favour of the mandible and skull being parts of one individual, but that the canine tooth, which is darker in colour and unduly worn, indicating a fully mature adult, belongs to another individual of the same race. The third molar, judging by the condition of the empty socket, had not yet fully erupted, indicating that the jaw belongs to a more youthful individual. Keith does not believe that Piltdown man is an ancestor of the modern races of mankind. See reaction from Smith 1914c)

Keith, A. 1914b. The reconstruction of fossil human skulls. *Journal of the Royal Anthropological Institute*, **44** (July), 12–31. (Keith, by way of an experiment, set out to demonstrate the validity of his reconstruction of the Piltdown skull, which differs from that proposed by Woodward. As a practical test, he was furnished with some fragments of a specimen skull which he engaged to reconstruct using the same methodology that was applied to Piltdown. This was deemed, by Keith, to have been a success. Summarised in *Nature*, 29 Oct 1914, p. 240. Keith devoted a whole chapter to this experiment in his *Antiquity of Man*, 1915.)

Keith, A. Oct 1915. *The antiquity of man*. London: Williams and Norgate, xx, 519 pp; further impressions issued 1915, 1916 & 1920. (About a third of the book is devoted to a detailed consideration of Piltdown Man, thus: Ch. XVIII. The discovery of the Piltdown skull, pp. 293–305; Ch. XIX. The antiquity of the Piltdown race, pp. 306–315; Ch. XX. *Eoanthropus dawsoni*, pp. 316–336; Ch. XXI. The difficulties of reconstruction, pp. 337–355; Ch. XXII. An experiment in reconstruction, pp. 356–375; Ch. XXIII. Heads—ancient and modern—in profile, pp. 376–396; Ch. XXIV. The brain of fossil man, pp. 397–429; Ch. XXV. The Piltdown mandible, pp. 430–452; Ch. XXVI. Evidence of the teeth of fossil man, pp. 453–478; Ch. XXVII. The face of fossil man, pp. 479–496. Keith avoids the inclusion of any reconstructions showing how *Eoanthropus* might have appeared in life. See reviews by Woodward 1915b, Wright, W. 1916)

Keith, A. 1916. The discoverer of the Piltdown skull. *British Medical Journal*, 19 Aug, 265. (An obituary of Charles Dawson. Not seen)

Keith, A. 1917. *Men of the Old Stone Age: Their Environment, Life, and Art*. By Henry Fairfield Osborn. [Book review]. *Man*, **17** (May), 82–85. (Keith cannot agree with Osborn's view that humanity is a product of the Pleistocene period. 'From a British point of view our author is all at sea as regards the discovery at Piltdown. For him the skull of *Eoanthropus* is that of an Englishman of the third interglacial period practicing a pre-Chellean culture. The lower jaw is that of a chimpanzee. Keith points out that just as wide a distinction in anatomy can be found in regard to the ape-like skullcap and human leg-bone presented in *Pithecanthropus* from Java.)

Keith, A. 1925a. *The antiquity of man*. 2nd ed. London: Williams and Norgate, 2 vols, 753 pp. (Piltdown, vol. II., pp. 399, 491–709, 721–724. As with the first edition, the front boards carry a gilt-embossed profile of a modern skull with the ‘Piltdown Fragments’ superimposed upon it, about which Kennedy 1992 makes an interesting, though incorrect, observation. Not seen)

Keith, A. 1925b. The fossil anthropoid ape from Taungs. *Nature*, **115** (14 Feb), 234–235. (Reaction to the announcement by Dart 1925 of his discovery of *Australopithecus*)

Keith, A. 1925c. The Taungs skull. *Nature*, **116** (4 July), 11. (Philip Tobias has accused Arthur Keith of rejecting the Taung skull (*Australopithecus*) as a human ancestor because it contradicted the evidence of Piltdown. Yet it seems clear from this letter to *Nature*, being a response to Raymond Dart’s announcement of his discovery in South Africa (Dart 1925), that Keith’s objection was in favour of Java Man, thus: ‘Prof. Dart has made a discovery of great importance, and the last thing I want to do is to detract from it. He has shown that anthropoid apes had extended, during the Pleistocene period, right into South Africa... He has found an extinct relative of the chimpanzee and gorilla but one with more man-like features than are possessed by either of these. His discovery throws light on the history of anthropoid apes but not on that of man. Java-man (*Pithecanthropus*) still remains the only known link between man and ape, and this extinct type lies on the human side of the gap.’ Dart’s rejoinder and Keith’s subsequent reply appeared in *Nature*, **116** (26 Sept), 462–463.)

Keith, A. 1925d. Concerning the rate of man’s evolution. *Nature*, **116** (29 Aug), 317–320. (‘Let us turn for a moment to another representative of mankind at the beginning of the Pleistocene period—Piltdown man. I think we are all agreed that his culture was pre-Chellean, and that his period is represented by the deepest and oldest bed of the 100 feet terrace. He thus belongs to an older and more primitive cultural period than that of Galley Hill man. In form of skull and in size and pattern of brain, this early representative of Pleistocene humanity does not differ markedly from living races; if not actually on our line of descent, the Piltdown type cannot be far removed from it. The anthropoid characteristics of his jaws and teeth are the chief obstacles to placing the Piltdown type on the direct line of our ancestry.’ This discourse was delivered at the Royal Institution on 6 March.)

Keith, A. Oct 1927. *Concerning man’s origin; being the presidential address given at the meeting of the British Association held in Leeds on August 31, 1927, and recent essays on Darwinian subjects*. London: Watts & Co, ix, 54 pp. (An elegant and readable summary of Keith’s views concerning man’s origin. See commentary under Keith 1928, which derives from the same address.)

Keith, A. 1928. Darwin’s theory of man’s descent as it stands to-day. *Report, British Association for the Advancement of Science*, Leeds, 1927, 1–15. (Keith marks the significance of Darwin’s great work, *The Descent of Man*, published in 1871, and looks at some of the important discoveries of fossil man that have occurred since Darwin’s death in 1882. He cites Piltdown as an example of ‘discordant evolution’, in which we find an essentially modern skull combined with an apelike jaw. ‘The same irregularity in the progression of parts is evident in the anatomy of *Pithecanthropus*, the oldest and most primitive form of humanity so far discovered. The thigh-bone might easily be that of a modern man, the skull-cap that of an ape, but the brain within that cap, as we now know, had passed well beyond an anthropoid status. If merely a lower jaw had been found at Piltdown an ancient Englishman would have been wrongly labelled ‘Higher anthropoid ape’; if only the thigh-bone of *Pithecanthropus* had come to light in Java, then an ancient Javanese, almost deserving the title of anthropoid, would not have passed muster as a man.’)

Keith, A. 1931. *New discoveries relating to the antiquity of man*. London: Williams and Norgate, 512 pp. (In the light of his detailed studies on the ‘London skull’, the author feels obliged to reconsider the status of *Eoanthropus*, which is here redefined as *Homo piltdownensis*, as he had done in 1913. See review by Smith 1931b.)

Keith, A. 1932. The evidence of palæontology with regard to evolution. *Report, British Association for the Advancement of Science*, London, 1931, 369–371. (‘The oldest fossil remains of man so far discovered are four in number: those of *Pithecanthropus* found by Dubois in Java (1891–93); of *Sinanthropus* discovered in China (1926–30); of *Eoanthropus* found by Dawson at Piltdown, England (1911–13); of *Palæanthropus*, represented by a lower jaw, found near Heidelberg (1907). There is general agreement that the four types of beings represented by these fossils must be accounted human, and that they differed in structure so much that they must be regarded as representing four separate genera of mankind... Besides these four early pleistocene forms there are two others, of later pleistocene date, worthy of mention because of the light they throw on the evolution of man, namely the Neanderthal type of Europe and the Rhodesia of Africa... As to the relationship of the three early pleistocene types of mankind—*Eoanthropus*, *Sinanthropus* and *Pithecanthropus*—to each

other and to the living races of mankind, there are many speculations but no definite data to guide us. I am less certain than I was that none of these is in the direct lineage of modern races. At one time I believed that the ape-like features in the jaw and teeth of Piltdown man excluded him from modern man's ancestry.')

Keith, A. 1933. Obituary: Mr. Lewis Abbott: prehistorian and jeweller. *The Times*, 12 Aug, 12. (Keith notes that Abbott 'was bold and resolute in formulating scientific explanations of past events, and perhaps more occupied with the contributions which he himself had made to his favourite subjects of study than those made by his fellow-workers... His important collection of flint and other prehistoric implements was acquired by the Wellcome Museum, London.' Another short obituary, by Henry Dewey, appeared in the *Quarterly Journal of the Geological Society of London*, 1934, **90** (2), 1–li.)

Keith, A. 1938a (speech given at unveiling of memorial to Charles Dawson on 22 July, see Anon. 1938)

[**Keith, A.**] 1938b. Piltdown man: a re-examination. *Nature*, **142** (1 Oct), 621. ('The reconstruction of the skull of Piltdown man has been reconsidered by Sir Arthur Keith in the light of later discoveries, and his results were communicated to Section H (Anthropology) at the Cambridge meeting of the British Association. He dwelt in particular on the anatomical resemblances between the Piltdown skull and the later Swanscombe skull [evidently ignoring the observations of Marston 1936b]. Ape-like features in the Piltdown bones and brain have escaped notice hitherto... Swanscombe man and the 'Lady of Lloyds' seem to be some of his remote descendants... the brain of Piltdown man, though moderate in volume and simple in convolutionary pattern, is asymmetrical to a degree rarely met with in modern heads, although it has been believed that asymmetry is a mark of a highly evolved brain, and confined to modern races of man...')

Keith, A. 1938–9. A resurvey of the anatomical features of the Piltdown skull, with some observations on the recently discovered Swanscombe skull. *Journal of Anatomy*, **75**, 155–185, 234–254. (Not seen)

Keith, A. 1944. James Reid Moir, 1879–1944. *Obituary Notices of Fellows of the Royal Society*, **4**, no. 13, 733–745.

Keith, A. 1947. Australopithecinae or Dartians. *Nature*, **159** (15 Mar), 377. ('When Prof. Raymond Dart... announced in *Nature* the discovery of a juvenile *Australopithecus* and claimed for it a human kinship, I was one of those who took the point of view that when the adult form was discovered it would prove to be near akin to the living African anthropoids—the gorilla and chimpanzee... I am now convinced, on the evidence submitted by Dr. Robert Broom [Broom & Schepers 1946], that Prof. Dart was right and that I was wrong; the Australopithecinae are in or near the line which culminated in the human form...')

Keith, A. 1948. *A new theory of human evolution*. London: Watts & Co, x, 451 pp. (In view of the latest evidence provided by Broom & Schepers 1946, Keith now accepts that 'of all the fossil forms known to us, the Australopithecines are the nearest akin to man and the most likely to stand in the direct line of man's ascent', although he differs from Broom in that he attributes the australopithecines to a period earlier than the Pliocene (pp. 210–11). He further accepts that Africa most probably represents the centre of dispersal for the forerunners of mankind (p. 214). 'It should now be my task to follow our anthropoid ancestors into the long Pliocene period, and to note the rise of their brain and their spread into the adjacent continents of the Old World. Alas!...not a fossil trace of Pliocene man has been found' (pp. 223–4). He thinks 'that Piltdown man was at least a contemporary of Heidelberg man; more likely he was of greater antiquity.' He notes that experts have attributed the Piltdown jaw to an extinct form of orangutan, or chimpanzee. 'It is quite true that the teeth do present a mixture of human and anthropoid features', while the cranium 'in its general structure conforms to the type met with in modern races of mankind... The discovery of Eoanthropus, or Piltdown, man (1911–13) presented students of human evolution with a conundrum. How are we to account for this unique type of early Pleistocene man in England while the rest of Europe, and apparently the whole of Asia, were inhabited by variants of the pent-browed type? If we could get rid of the Piltdown fossil fragments, then we should greatly simplify the problem of human evolution.' He thinks that England might have provided 'a refuge for early, aberrant continental types' (pp. 228–9, 231–2). 'One enigma remains: What became of the Piltdown race?' (p. 264).)

Keith, A. 1950. *An autobiography*. London: Watts & Co, 721 pp. (Recollections of Piltdown, pp. 323–329, 644–645, 654. Keith admits to 'a feeling of jealousy' that the Piltdown skull had gone to Smith Woodward at the Natural History Museum, rather than to his own Museum at the Royal College of Surgeons. He notes that 'As a palaeontologist Smith Woodward enjoyed, and deserved, the highest reputation, but he had no special knowledge of the human body. In our chance meetings he had struck me as a proud and cold man, one with whom I found it difficult to establish a friendship. No doubt he was just as jealous for the interests of his institution as I was for mine.' Keith describes his first impression of the skull and jaw, along with

Woodward's reconstruction, which he was invited to examine at South Kensington on 2 Dec 1912, his observations being carefully noted in his diary later that evening. His outspoken criticism of Woodward's reconstruction of the skull led to a meeting at the Museum of the Royal College of Surgeons in July 1913, which was attended by Woodward, Lankester, Pycraft, Underwood, Smith and Keith. In that year he resolved to write a book on Piltdown man, which soon expanded into a systematic account of all the important discoveries that had been made of prehistoric man (Keith 1915). In later years he and Smith Woodward became good friends and joint defenders of Piltdown man. Keith spent several months to June 1938 attempting a new reconstruction of the Piltdown skull, which was resolved to his satisfaction only when he determined that the left and right side of the skull were asymmetrical, the left half being much larger than the right. He spent eleven months exploring all aspects of the Piltdown–Swanscombe problem, the results of which were published in 1939. He mentions on more than one occasion the great warmth and respect that both he and Smith Woodward felt toward the 'honest' Charles Dawson.)

Keith, A. (see also: Anon. 1912a, 1913f, 1913h, 1955c, Harris, W. E., Woodward 1917b, 1948; for obituary see Le Gros Clark 1955c. For a discussion of Keith as a suspect in the Piltdown forgery see Turriffin 2006, 22–24.)

Keith, L. J. 1990. Piltdown plot. *New Scientist*, **128** (20 Oct), 59. (In response to Pat Shipman's review of Frank Spencer's recently published book in which he accuses Arthur Keith of being the Piltdown forger, the following letter was received from Mr Lindsay Keith: 'The notion that my late great uncle the anthropologist Sir Arthur Keith forged or even took any part in the Piltdown forgery is silly beyond belief. It does not stand up to serious examination. Of all those who stood to lose from such a fraud on the scientific establishment of the time, Keith had most to lose. It was no pleasure for him to be told at the age of 87 that modern dating methods had shown that he had been fooled over some 40 years. If he had been the forger, why would he have been still puzzling over the skull as long after the 1912 "discovery" as 1939?' L. J. Keith also wrote a short letter of complaint to *The Times* on 9 Oct in response to the views of Spencer 1990a as stated in a picture caption in *The Times* 3 Oct (Tait 1990), which adds nothing to the above statement. He had also written to the *Sunday Times* on 30 Sept, 'Piltdown book makes a monkey of my uncle' (not seen), having presumably obtained access to a copy of the book prior to its official release on 2 October.)

Kelly, R. 1998. For sale: the house with a missing link. *The Times*, 23 Sept. (The East Sussex manor where the remains of Piltdown man were found has been put up for sale for £1.6 million. The present Barkham Manor was built in the mid-1830s on the site of a much older house, and was extended in the 1920s. The current owner, Mark de Gruchy Lambert, was responsible for establishing Barkham Manor Vineyards in 1985 [one of its brands retails under the name 'Piltdown Man']. A detached oast house, barn, and modern buildings housing the winery and the vineyard are included in the sale.)

Kennard, A. S. 1947. Fifty and one years of the Geologists' Association. *Proceedings of the Geologists' Association*, **58** (4), 271–293. (In briefly discussing the eolith controversy, the writer notes that 'My mature judgement is that some show human work or usage but their age is uncertain. Over-enthusiasm has, however, been too prevalent, and I cannot see any trace of human work in the Eoliths from Piltdown.' There are also observations on W. J. Lewis Abbott, who 'was a short, stocky man, with a ferocious moustache, nearly always wore a boater in the field, and came from a remote part of Essex, the Dengie Hundred... Abbott was possessed of great imagination, but little clarity of exposition, and his papers are the worse for it... If the stories I have heard are to be believed, in his later years his imagination had complete control.')

Kennard, A. S. (contribution to discussions in Dawson & Woodward 1912, Dawson & Woodward 1914b; see also Hinton & Kennard 1905; for a biography of Kennard see Preece 1990. Kennard, who claimed to know who the forger was (as reported by Hinton in Spencer 1990b, 227), has himself thereby been implicated in the deed, e.g. Daniel 1974. Spencer 1990a, 176, alludes to the allegation that Hinton 'and Kennard, or another of his Ightham Circle followers, had engineered the forgery with a view to making a fool of Woodward.' The conjectured involvement of the Ightham Circle seems unlikely given that Woodward was a guarded supporter of eoliths. It was Hinton himself, in a letter to Gavin de Beer, dated 17 Mar 1954 (Spencer 1990b, 243), who speculated that 'some unbalanced member of old Ben Harrison's circle at Ightham' might have planted the material at Piltdown. See also remarks about Kennard's views in Weiner 1955b, 162–3, 168.)

Kennedy, K. A. R. 1991. Book review: [*Piltdown: A scientific forgery*, by F. Spencer]. *American Journal of Human Biology*, **3** (3), 308–310. (The reviewer is not supportive of Spencer's case against Arthur Keith, and instead points the finger of guilt at Chipper the goose. Cited in Turriffin 2006, 30.)

Kennedy, K. A. R. (contribution to discussion in Tobias 1992c: 'Having examined the Piltdown specimens at first hand, profited from a 20-year association with Oakley, and learned about Keith from my mentor

Theodore D. McCown, I welcome this opportunity to share my response to the portrayal of Keith as a culprit.' The writer points out the curious fact 'that Keith left undone...the careful supervision of the printer's sketch of the gold-embossed profile of the skull that appears on the cover of his 1915 book *Antiquity of Man*. The caption reads "Piltdown Skull," but Keith's preoccupation with the cranial vault and braincase at the expense of the mandible caused him to overlook the artist's rendering of a *modern* human jaw with well-developed mental eminence (Oakley, personal communication, 1961). It is unlikely this was the oversight of a forger eager to gain acceptance of a creation in which the simian character of the lower jaw declared its Pliocene ancestry to Heidelberg and later fossil hominids.' [This profile also appears as Fig. 98 in the text, where the caption reads 'Outline of a modern skull to show the number and position of the cranial fragments recovered at Piltdown.']. Regarding Tobias's case against Keith, the writer concludes that 'Nothing has been proved, but Keith has been cast in the worst light by the assembling of the circumstantial evidence against him.' He goes on to point the finger instead at Martin Hinton, based on a suspicion entertained by Oakley. In his reply Tobias, p. 281, points out an error in Kennedy's reading of the caption that accompanies the embossed illustration on the front cover of Keith's *Antiquity of Man*, which he says actually reads 'Piltdown Fragments.' However, see Tobias & Kennedy 1993.)

Kenward, M. 1954 (see Anon. 1954e, 1954g)

Kenward, M. 1955a. Piltdown forgery: when a digger found a "coco-nut." *Daily Telegraph*, 23 Feb. (A reaction to Weiner 1955b. The correspondent, Miss Mabel Kenward of Barkham Manor, says of Charles Dawson, who was steward of the manor, that 'On one occasion he noticed my father's workmen digging gravel by the side of the drive leading up to the house and asked if they might be allowed to watch for anything that looked different from the ordinary gravel stones (flints). One day, when they were digging in unmoved gravel, one of the men saw what he called "a coco-nut." He broke it with his pick, kept one piece and threw the rest away. This piece was handed to my father, who gave it back to the men, telling them to give it to Mr. Dawson... For Dr. Weiner to say in his book that the coco-nut story sinks into obscurity is absurd.' Kenward and Weiner had corresponded on this matter in July 1954 (Spencer 1990b, 246–247). There is also a letter from Kenward to Oakley, dated 15 Aug 1973, confirming the coconut story but introducing some confusion about dates (Spencer 1990a, 197). Bowden 1977, 12, cites an interview he had with Mabel Kenward about the coconut story. Vere 1955, 7, also gives an account evidently based on discussions with her. Walsh 1996, 256, is dismissive of her testimony because of inconsistencies between these accounts. See also Smith 1931a)

Kenward, M. 1955b. Red-letter days at Piltdown. *Sussex County Magazine*, **29** (7) July, 332–334, 336. (Mabel Kenward was the daughter of the tenant of Barkham Manor at the time of the Piltdown discoveries. Included in her recollection of events is an account of a mysterious intruder, a detailed description of whom she gave in a taped interview (Kenward 1973). The intruder has been assumed by some to have been Arthur Keith (e.g. Keith Langham in Spencer 1990a, 238 n. 10). Another suggestion is that it was Clifton Turner, Dawson's managing clerk, although it would surely have been unwise for an employee of Dawson to have behaved in such a strange fashion when challenged by Miss Kenward (see under Turner, C.). She recalls that Woodward and Dawson 'were often joined by other scientists—notably Professor (afterwards Sir Grafton) Elliot-Smith, Professor Barclay-Smith, Dr. Gordon, and Father Teilhard de Chardin. Also, one August, a number of undergraduates came to help.' She also recalls entertaining 'Professor Osborne, of the New York Museum, the Abbe Breuil, and Dr. Black of Pekin Museum.' She records several others visits to the Piltdown site by various groups in the years following the discoveries. Thus, in 1923 a society known as the Kibbo-Kift Kindred marked the discovery site with their own wooden sign which remained there until the official memorial was set up in 1938.)

Kenward, M. 1973. [Taped interview of Mabel Kenward at her home in Piltdown, by K. P. Oakley in the presence of Glyn Daniel and Mrs Robin Kenward, 3 August 1973.] Piltdown Archives, Palaeontology Library, Natural History Museum; quoted in part by Spencer 1990a, 238 n. 10 (concerning a tall, grey-suited intruder at Barkham Manor), & 239 n. 35 (the coconut story.)

Kenward, R. (Robert Kenward, Mabel Kenward's father, was tenant of Barkham Manor at the time of the Piltdown 'discoveries'. Charles Blinderman, while researching his book in the early 1980s, records that 'The present owner of Barkham Manor suggested to me, one would hope as a joke, that the past tenant of Barkham Manor, that is, the elder Kenward, did it as a joke' (Blinderman 1986, 81). Dawson had also written to Smith Woodward in Jan 1912 with news that 'some youths about here are preparing all sorts of prehistoric surprises for future diggings!' He had 'no doubt the young Kenwards are in it.' Blinderman adds that 'Identification of the young Kenwards as the Piltdown hoaxer would be the most satisfying comic conclusion to the inquest...' Robert Kenward jnr features in an often-reproduced photograph of the pit from 1912–13, which also includes Dawson, Smith Woodward, Venus Hargreaves and the infamous 'Chipper', e.g. Spencer 1990a, 32.)

Kermack, K. A. 1974. Ask the Piltdown Man. *The Times*, 9 Apr, 15. (In response to the article by Howard 1974, the correspondent, who is Reader in Vertebrate Palaeontology at the University of London, expresses disagreement with the suggestion that all of Charles Dawson's discoveries are fabrications. 'Dawson was the person who initiated the systematic search for Wealden mammals. He carried on this work initially alone, and later in collaboration with M. M. Teilhard de Chardin and Pelletier. He continued searching for at least 20 years. The search led to the discovery of the first Lower Cretaceous mammals known from anywhere in the world... Fifty years after Dawson had finished, my colleagues at University College—including Professor Clemens—and I took up the work again and discovered a considerable number of new specimens. Professor Clemens considers *Plagiaulax dawsoni* to be doubtfully mammalian. I think that he is probably right, although Dr van Valen in 1967 accepted *P. dawsoni* as a genuine Wealden mammal. There is no question here of "fabrication"—only a legitimate difference of opinion in the assessment of a fragmentary and difficult specimen. As far as the Wealden mammals are concerned Dawson's reputation is quite safe.')

Kermack, K. A., Lees, P. M. & Mussett, F. 1965. *Aegialodon dawsoni*, a new trituberculosectorial tooth from the Lower Wealden. *Proceedings of the Royal Society, B*, **162**, 535–554, plates 55–58. (Describes a new mammalian tooth from the Lower Wealden bone-bed at Cliff End, near Hastings. The tooth was not found by Charles Dawson, but is named in his honour because he was the first person to search deliberately for mammalian teeth in the Wealden.)

King, T. M. 1983a. Teilhard and Piltdown. In: *Teilhard and the unity of knowledge: the Georgetown University centennial symposium* / edited by T. M. King & J. F. Salmon. Ramsey, NJ: Paulist Press, pp. 159–169. (A detailed refutation of Gould's arguments implicating Teilhard in the Piltdown forgery, based on a lecture by J. S. Weiner delivered at Georgetown University, 28 April 1981. A videotape of Weiner's talk is held at the Georgetown University Library: *J. S. Weiner on Teilhard and the Piltdown Man*. See also comments in Introduction, pp. 1–4. Weiner, who died 14 months later, considered Dawson to be the sole culprit. What becomes apparent from this discussion is Gould's method of manipulating evidence in support of his opinions (see also McCulloch 1983). Extracts from the videotape also feature in Pitts 2004.)

King, T. M. 1983b. Teilhard, Gould and Piltdown. *America*, **148** (18 June), 471–472. (Not seen)

King, T. M. 1994. Piltdown revisited. *Teilhard Perspective*, **27**, 10–12. (Not seen)

King, W. 1864. The reputed fossil man of the Neanderthal. *Quarterly Journal of Science*, **1**, 88–97. (The writer believes that the character of the remains from Neanderthal, discovered in 1856, are so different from those of contemporary man as to require separate specific status, for which he proposes the name *Homo neanderthalensis*. Controversy over the status of the finds continued unabated for many years until further discoveries convinced the sceptics that fossil man existed. Of particular importance in this respect was the discovery of the La Chapelle-aux-Saints skeleton in 1908, which shares numerous features in common with the Neanderthal remains. Boule (1911, 1912, 1913) was in no doubt that they were co-specific and declared the French find the type skeleton of the species.)

King, W. B. R. 1955. The Pleistocene epoch in England. *The Quarterly Journal of the Geological Society of London*, **111** (2), 187–208. (A review of the evidence on the position of the boundary line between the Pliocene and Pleistocene is given. This leads to an acceptance of a boundary in England between the Coralline Crag and the Waltonian division of the Red Crag. A plea is made for basing the boundary on stratigraphical rather than climatological considerations. See also King & Oakley 1950)

King, W. B. R. (Chairman) & Oakley, K. P. (Secretary) 1950. Report of the Temporary Commission on the Pliocene-Pleistocene Boundary, appointed 26th August, 1948. In: *International Geological Congress: report of the eighteenth session, Great Britain, 1948. Part I. General proceedings* / edited by A. J. Butler. London, pp. 213–4. ('The Commission considers that it is necessary to select a type-area where the Pliocene-Pleistocene (Tertiary-Quaternary) boundary can be drawn in accordance with stratigraphical principles. The Commission considers that the Pliocene-Pleistocene boundary should be based on changes in marine faunas, since this is the classic method of grouping fossiliferous strata. The classic area of marine sedimentation in Italy is regarded as the area where this principle can be implemented best. It is here too that terrestrial equivalents of the marine faunas under consideration can be determined. The Commission recommends that, in order to eliminate existing ambiguities, the Lower Pleistocene should include as its basal member in the type area the Calabrian formation (marine) together with its terrestrial equivalent the Villafranchian. The Commission notes that according to evidence given this usage would place the boundary at the horizon of the first indications of climatic deterioration of the Italian Neogene succession. — Approved unanimously at a meeting of the Commission held on August 28th, 1948, and also by an almost complete majority at a meeting of Section H attended by about 150 members.' See also reports by Baden-Powell 1950, and Oakley 1950a.)

Kirkaldy, J. F. & Bull, A. J. 1940. The geomorphology of the rivers of the southern Weald. *Proceedings of the Geologists' Association*, **51** (2), 115–150, plates 6–10. (Presents an examination of longitudinal profiles and superficial deposits of the rivers Cuckmere, Ouse, Adur and Rother-Arun. 'In the Ouse valley great prominence has been given to a patch of river gravel, at 110 to 120 ft. O.D., at Barkham and Moon's Farm, Piltdown, which has yielded the Piltdown skull. Special efforts have, therefore, been made to correlate this with other river gravels in the valley.' After discussing the Piltdown gravel and its possible correlatives, the authors are 'forced to conclude that the small patch of gravel at Piltdown is unique, both as regards its archaeological and its geomorphological importance.')

Klaatsch, H. 1913. *Eoanthropus Dawsoni*. *Umschau*, **17**, 745–747 (with 7 figs). (Not seen)

Kleinschmidt, O. 1922. *Realgattung Homo sapiens (L.): Eine naturgeschichtliche Monographie des Menschen*. Halle, 38 pp, 8 plates. (*Eoanthropus* here redefined as *Homo sapiens dawsoni*, pp. 7–9, 38, plates VI & VIII)

Kleinschmidt, O. 1931. *Der Urmensch*. 2nd ed. Leipzig, 156 pp, 16 plates. (*Homo sapiens dawsoni*, pp. 43–55, etc, plates VII, VIII, XI)

Koenigswald, G. H. R. von 1981. Piltdown in letters. *Natural History*, **90**, (6), 21–25. (Defends Teilhard de Chardin against Gould's accusation of complicity in the Piltdown affair)

Koestler, A. 1949. *Insight and outlook: an inquiry into the common foundations of science, art and social ethics*. London: Macmillan, xiv, 442 pp. (Cited by Oakley 1979b)

Kohn, A. 1986. *False prophets: fraud and error in science and medicine*. Oxford: Basil Blackwell, 226 pp. (Cited in Tobias 1992c)

Kramer, L. M. J. 1953. Piltdown Man. *The Times*, 28 Nov, 7. (In response to recent revelations about the Piltdown forgery, the correspondent writes: 'May we now regard the Piltdown Man as the first human being to have false teeth?')

Krogman, W. M. 1973. Book reviews: [*The Piltdown Men*, by R. Millar]. *Bulletin of the New York Academy of Medicine*, **49** (11) Nov, 1011–1016. (Cited in Turrittin 2006)

Krogman, W. M. 1978. The planned planting of Piltdown: Who? Why? In: *Human evolution: biosocial perspectives* / edited by S. L. Washburn & E. R. McCown. Menlo Park: Benjamin-Cummings Publishing Co, pp. 239–252. (The author had studied the Piltdown jaw at the Royal College of Surgeons in 1931 and had concluded, based on the wear shown by the molar teeth, that it belonged to a chimpanzee. He had not suspected orangutan, 'for the crenulated molar cusp pattern of the occlusal surface of the orangutan molar was not in evidence; and no wonder, for all such crenulations had been carefully removed by abrasion to give a false human wear-pattern.' He regards the creation of Piltdown II as the forger's gravest mistake. It was done perhaps to shore up whatever doubts Piltdown I may have raised, but it went beyond the brink of credulity. The writer, who was acquainted with Teilhard de Chardin, Keith and Elliot Smith, considers more specifically the evidence for and against the involvement of Dawson and Smith, and concludes that the case against Dawson is the stronger.)

Kruszyński, R. 2012. The Piltdown Collection: an inventory. London: Natural History Museum, 8 pp. (Prepared for delegates at The Piltdown Centenary Conference, Lewes, 22 Sep 2012)

Lake, R. D., Young, B. et al. 1987. *Geology of the country around Lewes: memoir for 1:50 000 geological sheet 319 (England & Wales)*. London: Her Majesty's Stationary Office, viii, 117 pp. (Quaternary/Older Drift Deposits, p. 78: Kirkaldy & Bull 1940 considered the gravels at Barkham, Piltdown, to be a unique deposit, but they are here equated with the Third Terrace of the River Ouse; Quaternary/River Gravels, pp. 81–83: The River Ouse valley contains a series of four terraces of river gravel, as well as alluvium. Individual terrace units are sometimes poorly defined owing probably to periglacial remobilisation.)

Lambert, J. B. 1997. *Traces of the past: unraveling the secrets of archaeology through chemistry*. Reading, Mass: Perseus Books, xii, 319 pp. (Discussion of analytical techniques used on the Piltdown remains, pp. 223–226. Cited in Turrittin 2006)

Lancaster, O. 1953. Pocket cartoon. *Daily Express*, 24 Nov. (Osbert Lancaster's cartoon shows an elegant lady and an ape-like gentleman at a high-class gathering, with the words: "Now tell me, Lady Littlehampton, just what makes you cling to your belief in the genuineness of the Piltdown Man?" Reproduced in Spencer 1990a, 140.)

Langdon, J. H. 1991. Misinterpreting Piltdown. *Current Anthropology*, **32**, 627–631. (The writer believes that Dawson acted alone and without expert assistance. The forgery was ‘fairly good for its time in terms of palaeontology but weak anatomically. Although some of the discrepancies are very subtle, taken together they appear to belie the hypothesis that an expert in anatomy was involved... the forgery appears to be the work of an amateur attempting a serious scientific fraud.’)

Langdon, J. H. 1992a. Book review: [Spencer 1990]. *American Anthropologist*, **94**, 518–520. (Cited in Turritin 2006)

Langdon, J. H. 1992b. Lessons from Piltdown. *Creation / Evolution*, **12** (2), no. 31, 11–27. (Uses the Piltdown forgery to demonstrate both the successes and failures of the scientific method.)

Langdon, J. H. 1993. Self-correction in science: the case of the Piltdown hoax. In: *The natural history of paradigms: science and the process of intellectual evolution* / edited by J. H. Langdon & M. E. McGann. Indianapolis: University of Indianapolis Press, pp. 69–82.

Langham, I. 1978. Talgai and Piltdown – the common context. *Artefact*, **3** (4), 181–224. (Implicates Elliot Smith in the Piltdown fraud, and suggests that the Talgai skull may have acted as the model for Piltdown. The premise rests primarily on the claimed physical similarities between Piltdown and Talgai, such as the modern braincases, primitive dentitions including interlocking canines (later shown to be incorrect for Talgai) and thick crania. Subsequently Langham would change his mind and point the finger at Keith. See Allen 2010, Smith, S. A. 1918.)

Langham, I. 1979. The Piltdown hoax. *Nature*, **277** (18 Jan), 170. (Dismisses Halstead’s presentation of Douglas’s assertion that W. J. Sollas was involved in the ‘hoax’, and instead implicates Elliot Smith and Smith Woodward)

Langham, I. 1984. Sherlock Holmes, circumstantial evidence and Piltdown Man. *Physical Anthropology News*, **3** (1), 1–5. (‘Historical research *should*...be cumulative. However, despite the considerable amount of energy which has been extended over the past three decades on matters Piltdownian, standards of scholarship on the culpability issue have been declining steadily ever since the publication of J. S. Weiner’s book, *The Piltdown Forgery*... John Hathaway Winslow and Alfred Meyer’s attribution of the forgery to Sir Arthur Conan Doyle merely represents the latest (and flimsiest) of a number of recent attempts to implicate a famous or eminent person through the assembling of purely circumstantial evidence.’ Langham goes on to criticise the Winslow-Meyer presentation (1983) on many counts, and concludes that their ‘case against Conan Doyle is not only ill-supported, but that it is also obfuscatory of science itself.’ Alas, Langham himself had already built a similarly unsound case against another ‘eminent person’, Sir Arthur Keith, after having abandoned an earlier belief in Elliot Smith’s complicity. Langham, based at the University of Sidney, died in July 1984, but his Piltdown research was passed to Frank Spencer, and forms the basis of Spencer 1990a.)

Lankester, E. R. 1907. Address by Professor E. Ray Lankester, M.A., LL.D., D.Sc., F.R.S., F.L.S., Director of the Natural History departments of the British Museums, President. *Report of the British Association for the Advancement of Science*, York, August 1906, 3–42. (In reviewing the advances that have been made in science over the last 25 years, the speaker pauses briefly in respect of ‘the growing and important science of anthropology’, to mention ‘the discovery of the cranial dome of *Pithecanthropus* in a river gravel in Java—undoubtedly the most ape-like of human remains, and of great age; and further, the Eoliths of Prestwich, in the human authorship of which I am inclined to believe, though I should be sorry to say the same of all the broken flints to which the name ‘Eolith’ has been applied.’)

Lankester, E. R. 1912a. On the discovery of a novel type of flint implements below the base of the Red Crag of Suffolk, proving the existence of skilled workers of flint in the Pliocene age. *Philosophical Transactions of the Royal Society of London, Series B*, **202**, no. B.290, 24 Apr, 283–336, plates 14–17. (Based on the discoveries made by J. Reid Moir at Ipswich in the autumn of 1909 and regarded by him as providing ‘indisputable evidence of Pre-Crag [Pliocene] man’, the writer here presents a detailed account in support of Moir’s interpretation. He particularly focuses on flints of roughly triangular form with pointed, often curved beaks. He considers that these ‘rostrum-carinate’ or ‘eagle’s beak’ flints were ‘not improbably used for dressing and smoothing the skins of animals.’ Moir had stated, in a letter to *The Times*, dated 17 Oct 1910 (reproduced here), ‘My discovery, of course, means that our ideas of the antiquity of man must be somewhat altered, as these specimens, though of such an extreme antiquity, exhibit a knowledge of flint chipping far in advance of any Eolithic work, and the question arises, as this is so, to what period the Eoliths belong.’)

Lankester, E. R. 1912b (contribution to discussion in Dawson & Woodward 1912: Lankester had been permitted to examine the Piltdown jaw and skull some weeks prior to the meeting on 18 Dec, and with Dawson had revisited the locality where they were found, but 'He did not consider it certain that the lower jaw and the skull belonged to the same individual.')

Lankester, E. R. 1912b. The new fossil man from Sussex. *Daily Telegraph*, 19 Dec. (Includes a figure comparing the Piltdown jaw with those of Heidelberg, modern human and chimpanzee. Not seen.)

Lankester, E. R. 1913a. Facts and theories about primeval man – I. *Daily Telegraph*, 6 Jan. (Not seen)

Lankester, E. R. 1913b. From ape to man – II. *Daily Telegraph*, 27 Jan. (Not seen)

Lankester, E. R. 1913c. From ape to man – III. *Daily Telegraph*, 3 Feb. (Not seen)

Lankester, E. R. 1913d. From ape to man – IV. *Daily Telegraph*, 12 Feb. (Not seen)

Lankester, E. R. 1913e. A tooth which was lost and is found. *Daily Telegraph*, Dec. (Not seen)

Lankester, E. R. [Sept] 1915. *Diversions of a naturalist*. London: Methuen & Co, xvi, 424 pp. (Ch. 30: The missing link: an enthusiastic endorsement of *Eoanthropus*, focusing in particular on the jaw, pp. 275–291. He concludes that the discovery at Piltdown 'brings the focus of interest in the knowledge of primitive man away from the caves of France to the thin patch of iron-stained gravel in the meadow-land of the River Ouse as it flows through the Sussex Weald. These remains are the first remains of a man-like creature found in a Pleistocene river gravel, and they exceed in interest any human remains as yet known.' Given the varying age of the assemblage at Piltdown, he sees no reason to assume that *Eoanthropus* was capable of making any of the flint 'implements' found with it. 'Nor is there any evidence to show that the humanly cut elephant-bone recently found at Piltdown by Mr. Dawson was cut by *Eoanthropus*.' In a footnote on p. 284, he briefly alludes to 'the recent discovery by Mr. Dawson of a second skull of the same character as the first', being evidently a reference to the Sheffield Park find which had yet to be publicly announced. Lankester referred to the new find also in a letter to Gerrit Miller dated 23 Dec 1915: see Spencer 1990b, 135.)

Lankester, E. R. 1921. A remarkable flint from Piltdown. *Man*, **32**, 59–62.

Lankester, E. R. (see also Daniel 1972; Woodward 1917b, 1918a)

Lavers, R. 1995. The ancient East Cliff cemetery. *Hastings Area Archaeological Research Group Journal*, new ser, no. 1, 15–19. (Records the discovery and excavation of a probable Anglo-Saxon cemetery by Thomas Ross, Mayor of Hastings, in 1856. One of the skulls was abnormally thick at just under half an inch. Clements 1997a–b has suggested that Dawson might have acquired this skull, or other examples with unusually thick calvaria that have been reportedly excavated in the Hastings area from time to time. Not seen)

Lawrence, G. F. (contribution to discussion in Dawson & Woodward 1914b: 'Mr. G. F. Lawrence said that the form of the implement suggested a club. Its general surface was older than the cutting, being different in colour and more abraded.')

Le Double, A.-F. 1912. *Traite de variations de la colonne vertébrale de l'homme, et leur signification au point de vue de l'anthropologie zoologique*. Paris: Vigot Freres. (In this work the writer draws attention to the existence of certain human skeletons possessing an additional, i.e. thirteenth, thoracic vertebra. It might be conjectured that Charles Dawson was attempting to plagiarise this work when he wrote in anxious haste to Smith Woodward on 12 May 1912 (Spencer 1990b, 21–22) asking him if he would present Dawson's paper on 'The 13th Dorsal Vertebra' to the Royal Society, claiming it as 'a new subject'. A more charitable explanation might be that Dawson had made this discovery himself while making anatomical studies at the museum of the Royal College of Surgeons, where he found several examples of the 13th dorsal vertebra, and then got wind that the French work was about to deny him priority of discovery. Le Double had published a similar treatise in 1903 on the human cranium, and another in 1906 on the face. Anatole-Félix Le Double (1848–1913) was passionate about prehistory and palaeopathology. One thus wonders if Dawson was also familiar with the 1903 work. While it is unclear to what extent Dawson could read French, he did publish a French-language guide to Hastings (Dawson 1903c), and his studies of the restoration of the Bayeux Tapestry (Dawson 1907a) may have required him to consult French sources. His wife, Hélène, was of French birth. For Dawson's paper on the 13th dorsal vertebra, which was never published, see Dawson 1912.)

Le Gros Clark, W. E. 1949(–1970, 10th ed). *History of the primates: an introduction to the study of fossil man*. London: Trustees of the British Museum (Natural History), 117 pp. (1949); 127 pp. (1965, 1970). (In the first edition of this work the author considered the Piltdown remains to present ‘a puzzle of a most bewildering kind, a puzzle which even now, twenty-five years after the discovery at Piltdown, remains unresolved. If the jaw really belongs to the skull it is a most unexpected combination. If it does not belong to the skull, it is an almost unbelievable coincidence that they should have been in such close proximity in the same limited patch of gravel... It is obvious that the Piltdown remains are fraught with the greatest interest, but, because experts still disagree on their significance, they should (after due consideration) be laid aside without further comment until more evidence becomes available.’ By the time of the final 10th edition of this work the author could state that ‘For the students of fossil Man, this investigation of the Piltdown remains was of particular importance because it emphasized the need for the greatest care in the study of fossils alleged to be of great antiquity. But it was even more important because, by demonstrating the application of modern techniques (such as microchemical tests, X-ray spectrography, and crystallographic analysis) in the study of fossil bones, it has now made it virtually impossible for anyone to perpetrate a similar hoax in the future.’)

Le Gros Clark, W. E. 1950. New palaeontological evidence bearing on the evolution of the Hominoidea. *Quarterly Journal of the Geological Society of London*, **105** (2), 225–264, plates XI–XV. (New discoveries of australopithecines in South Africa show that ‘The combination of cranial and dental characters provides strong morphological evidence for placing the Australopithecinae in the hominid rather than the pongid sequence of evolution.’ The demonstration by Oakley (1950) that the Piltdown skull and jaw are of roughly the same age but considerably younger than originally thought makes it ‘difficult to avoid the conclusion that “Piltdown Man” was a somewhat specialized type that persisted until relatively late times.’)

Le Gros Clark, W. E. 1954a. The antiquity of *Homo sapiens* in particular and of the Hominidae in general. *Science Progress*, **42**, no. 167 (July), 377–395. (Including *Homo neanderthalensis*, *Pithecanthropus* and *Australopithecus*)

Le Gros Clark, W. E. 1954b. The molar teeth in the Piltdown jaw. *Proceedings of the Geological Society of London*, no. 1514 (15 Sept), cxv–cxvi. (Report of a presentation made at a meeting of the Society on 2 June 1954, demonstrating the results of new investigative techniques applied to the Piltdown assemblage.)

Le Gros Clark, W. E. 1954c. Reason and fallacy in the study of fossil man. *Advancement of Science*, **11**, no. 43 (Dec), 280–292. (A general survey of the fossil evidence available which has a bearing on the evolutionary origin of modern humans)

Le Gros Clark, W. E. 1955a. An anatomical study of the Piltdown teeth and the so-called turbinal bone. In: Further contributions to the solution of the Piltdown problem / J. Weiner *et al.* *Bulletin of the British Museum (Natural History), Geology*, **2** (6), 234–242 + unnumbered plate. (The Piltdown molar teeth and canine are shown to have been artificially abraded. A perforation penetrating the pulp cavity of the canine, the result of excessive attrition, has been plugged with some plastic material. The molar teeth are almost certainly those of an orangutan. The so-called ‘turbinal bone’ proves to be a series of splinters probably derived from the shaft of a limb bone of some small mammal.)

Le Gros Clark, W. E. 1955b. The exposure of the Piltdown forgery. *Proceedings of the Royal Institution of Great Britain*, **36**, 138–151; a shortened version appeared in *Nature*, **175** (4 June), 973–974; the full paper is reprinted in Le Gros Clark 1968. The writer avoids the question of who perpetrated the forgery.)

Le Gros Clark, W. E. 1955c. Arthur Keith, 1866–1955. *Biographical Memoirs of Fellows of the Royal Society*, **1**, 145–161, plate.

Le Gros Clark, W. E. 1967. *Man-apes or ape-men? The story of discoveries in Africa*. New York: Holt, Rinehart and Winston, vii, 150 pp; reprinted 1976 by Robert E. Krieger Publishing Company, New York. (A history of research on *Australopithecus*. Raymond Dart’s ‘prehuman’ claim for *Australopithecus* in 1925 was based in part on the evidence of the brain (endocranial) cast, which had at this time been somewhat discredited as an indicator of such things as intellectual development, manual dexterity, the acquisition of speech and so forth (e.g. Symington 1915, 1916). The reaction in England to Dart’s claim to have found the ‘missing-link’ was generally unfavourable, and Clark outlines the reasons why his preliminary paper (Dart 1925) ‘alerted the minds of anthropologists generally to the possibility that in his too enthusiastic zeal Dart had claimed far more for his australopithecine skull than was warranted by the evidence.’ Also the exact form of the teeth was not yet clear since they were encrusted in matrix. Keith, Elliot Smith, Duckworth and Smith Woodward all concluded that *Australopithecus* was unlikely to be antecedent to humans. Clark notes that ‘Of these four referees, no doubt Smith Woodward was the least qualified to pronounce judgement on

Australopithecus, for although he had written a few short reports on some palaeolithic human skulls and the jaw of a fossil ape, and had also reconstructed and described in detail the then famous (but now infamous) Piltdown skull, his authoritative field of work had been mainly confined to the study of fossil fishes and reptiles.’)

Le Gros Clark, W. E. 1968. *Chant of pleasant exploration*. Edinburgh: E. & S. Livingstone, vii, 250 pp. (An autobiography of Sir Wilfrid Edward Le Gros Clark (1895–1971), anatomist, surgeon, primatologist and palaeoanthropologist; with a chapter on ‘The exposure of the Piltdown forgery’, pp. 210–226, reprinted from Le Gros Clark 1955b.)

Le Gros Clark, W. E. (see also under Anon. 1954c, Weiner *et al.* 1953)

Leakey, L. S. B. 1934. *Adam’s ancestors: an up to-date outline of what is known about the origin of man*. 2nd ed. London: Methuen, 244 pp, 12 plates. (*Eoanthropus*, pp. 219–221, plates V, VII, XII. Not seen.)

Leakey, L. S. B. 1953. *Adam’s ancestors: an up-to-date outline of the Old Stone Age (Palaeolithic) and what is known about man’s origin and evolution*. 4th ed. London: Methuen & Co. Ltd. (Leakey expresses his personal conviction that the Piltdown jaw cannot belong to the same individual as the skull, for otherwise Piltdown man would be ‘unique in all humanity’, pp. 188–189, 212, plate XVI. In an addendum, inserted after Leakey’s book had gone to press, he discusses the exposure of the ‘hoax’ by Oakley and his team in Nov 1953, noting that the absence of the first premolar from the faked jaw had been necessary if the fraud were not to be detected at the outset, since both in its crown and root structure it would have differed so completely from a human first premolar; the articulating condyle had been removed for the same reason.)

Leakey, L. S. B. 1974. *By the evidence: memoirs, 1932–1951*. New York & London: Harcourt Brace Jovanovich, 276 pp. (Considers that Dawson had an unnamed accomplice at Piltdown, pp. 22–24. In Leakey & Goodall 1969 he was more specific on this point. He regards the whole affair as a prank that ‘failed because Charles Dawson, one of the parties to the practical joke, died before the time had arrived to tell the truth. The other man, I suspect, dared not accept responsibility for revealing what had been done when the corroboration of his partner was no longer available.’ He recalls visiting the Natural History Museum in 1933 for the purpose of examining the Piltdown specimens. He was ‘not allowed to handle the originals in any way, but merely to look at them and satisfy myself that the casts were really good replicas. Then, abruptly, the originals were removed and locked up again, and I was left for the rest of the morning with only the casts to study.’ (The same complaint is made by Hinton 1953). He suggests that such an attitude by the NHM might explain how the forgery remained unmasked for so many years. The situation changed only when the fossils came under the care of Kenneth Oakley, who ‘did not see the necessity of treating the fragments as if they were the crown jewels...’)

Leakey, L. S. B. & Goodall, M. 1969. *Unveiling Man’s origins: ten decades of thought about human evolution*. Cambridge, MA: Schenkman Publishing Co, 220 pp. (Leakey sets out his conviction that Teilhard de Chardin was implicated in the Piltdown ‘hoax’, pp. 90–100, 152–156. A note about Leakey’s ‘forthcoming book’ on this subject was alluded to in the Ariadne column in *New Scientist*, 10 Dec 1970, 48, 471; Morell 1995 notes the existence of an unfinished book draft. Leakey died 1 Oct 1972.)

Leakey, L. S. B. (see also: Daniel 1975; Cole, S. M. 1975; Morell 1995)

Lenhossék, M. von 1914. Der Piltdowner Schädelfund. *Barlangkutató*, 2, 1–18, 39–42.

Lenhossék, M. von 1920. Das innere Relief des Unterkieferastes. *Archiv für Anthropologie*, NF, 18 (whole series 49), 49–59. (Does not accept the hominid character of the Piltdown jaw)

Levin, B. 1990. Was the expert of experts history’s greatest skuldugger? *The Times*, 21 June, 12. (Bernard Levin is unimpressed by the case made against Sir Arthur Keith by Frank Spencer in a book to be published in October. It prompted a response from Stringer 1990b. See Levin 1992 for a reprint of this article.)

Levin, B. 1992. *If you want my opinion*. London: Jonathan Cape Ltd, 252 pp. (Chapter entitled ‘Ah, sweet mystery of life’, pp. 22–25, reprinted from Levin 1990)

Lewin, R. 1987. *Bones of contention: controversies in the search for human origins*. New York: Simon & Schuster, 348 pp. (Reprinted 1997, University of Chicago Press, in which Turrill cites pp. 60–75)

Lewis, J. (John Lewis is one of those tainted by association with Charles Dawson, e.g. Dawson & Lewis 1896, Combridge 1977b. John Combridge 1981 has suggested the possible involvement of Lewis as co-conspirator with Dawson in the Piltdown forgery. Russell 2003, 255–260, discusses their relationship at some length. See also Dawson 1901c)

Lowenstein, J. M. 1985. Molecular approaches to the identification of species. *American Scientist*, **73**, 541–547. (Application to the Piltdown jaw, confirming its orangutan identity, p. 545)

Lowenstein, J. M. 1991. The Piltdown industry. *Pacific Discovery*, **44** (2), 46–48. (Comment on Spencer 1990. Cited in Turritin 2006)

Lowenstein, J. M., Molleson, T. & Washburn, S. L. 1982. Piltdown jaw confirmed as orang. *Nature*, **299** (23 Sep), 294. (An immunological analytical technique, which permits identification of species-specific proteins, has been applied to the collagen in the Piltdown jaw and canine, the results of which confirm that both derive from an orangutan. It would thus seem likely that whoever put the canine tooth into the gravel pit must have known that the jaw was also that of an orangutan.)

Lubenow, M. L. 1992. *Bones of contention: a creationist assessment of human fossils*. Grand Rapids, Michigan: Baker Book House, 295 pp. (Title evidently inspired by Lewin 1987. claimed to be ‘the most complete and accurate critique of the fossils of the so-called ‘ape-men.’ The myth of human evolution is completely demolished.’ Piltdown, pp. 39–44. Revised edition issued 2004, 400 pp.)

Lukas, M. 1981a. Teilhard and the Piltdown “hoax”: a playful prank gone too far? Or a deliberate scientific forgery? Or, as it now appears, nothing at all? *America*, **144**, no. 20 (23 May), 424–427. (Defends Teilhard de Chardin against Gould’s accusation of complicity in the Piltdown affair. Among the many papers relating to Piltdown at the Natural History Museum archives, the writer had examined a map drawn up by Dawson and dated Jan 1913. Each of the three Piltdown sites on this map is marked by an ‘X’. Lukas argues that the Barcombe Mills ‘X’ marks a presumptive site, unaware that this was most likely the site mentioned by Dawson in 1913 as having yielded a fragment of human skull, and to which Teilhard was taken. This piece of information undermines a key element of Gould’s argument, though unhappily, Mary Lukas did not at the time of her visit receive sufficient information to make sense of Barcombe Mills. It may well be supposed that Barcombe Mills (which we are obliged to call Piltdown III) was a failed first attempt by Dawson to establish Piltdown II—Sheffield Park being his second attempt.)

Lukas, M. 1981b. Gould and Teilhard’s “fatal error”. *Teilhard Newsletter*, **14** (1), July, 4–6. (Not seen)

Lukas, M. & Lukas, E. 1977. *Teilhard: a biography*. London: Collins, 350 pp. (Cites letter from Teilhard to Abbé Breuil, written after the exposure of the forgery, in which he still professes disbelief that Dawson could have been the perpetrator. Not seen)

Lukas, M. & Lukas, E. 1983. The haunting. *Antiquity*, **57**, no. 219, 7–11. (Further remarks in defence of Teilhard de Chardin against continuing accusations from Gould. It is clear from the argument, however, that there was still confusion about the significance of Barcombe Mills, since the authors believed that it was Sheffield Park that was seen by Teilhard in 1913, rather than the former place.)

Lutes, A. O. 1996. Riddle of the tenth man. *Nature*, **381** (27 June), 728. (‘Brian Gardiner’s contention that Martin A. C. Hinton was the perpetrator of the Piltdown hoax adds another culprit, but he lets Charles Dawson off the hook too easily... Dawson was the one person consistently present at all the Piltdown discoveries. To say he was Hinton’s dupe throughout gives Hinton almost omniscient power over Dawson...’)

Lüttgendorff, M. A. von 1913. Der Mensch von Sussex. *Umschau*, **17**, 221–222. (Cited in Quenstedt 1936)

Lydekker, R. 1888a. Note on a new Wealden Iguanodont and other dinosaurs. *Quarterly Journal of the Geological Society of London*, **44** (1), 46–61 (with discuss), plate III. (‘The primary object of this communication is to bring to the notice of the Society numerous remains of an apparently new Iguanodont Reptile obtained by Mr. C. Dawson, F.G.S., of St. Leonards, from the Wadhurst Clay...and recently acquired by the British Museum...’ The new dinosaur is named *Iguanodon dawsoni* and was found near Hastings. In the discussion which followed the reading of this paper ‘Dr. H. Woodward said Mr. Dawson, the discoverer of some of the fossils described, deserved great praise for his energy in collecting, and for the valuable specimens contributed by his assistance to the Museum.’)

Lydekker, R. 1888b. *Catalogue of the fossil Reptilia and Amphibia in the British Museum (Natural History). Part I. Containing the orders Ornithosauria, Crocodilia, Dinosauria, Squamata, Rhynchocephalia, and Proterosauria.* London: Printed by order of the Trustees, xxviii, 309 pp. (The following catalogued items are from the Dawson Collection: *Iguanodon dawsoni*, Lydekker, from the Wadhurst Clay, near Hastings, purchased 1884–87, pp. 196–200; *Iguanodon bernissartensis*, Boulenger, including a femur and four other fragments from the Wadhurst Clay of Hollington, purchased 1887, p. 217; various imperfect specimens of *Iguanodon*, not identifiable to species, from the Wadhurst Clay of the Hastings area, one of which is from Ridge Quarry, and another from Silverhill, pp. 232, 234, 236, 237.)

Lydekker, R. 1889. Notes on new and other dinosaurian remains. *Geological Magazine*, dec. 3, **6** (8), 352–356. (Including two new species, *Iguanodon fittoni* and *I. hollingtoniensis*, collected by Charles Dawson from the Wadhurst Clay at Shornden and Hollington, near Hastings, pp. 354–6)

Lydekker, R. 1890. *Catalogue of the fossil Reptilia and Amphibia in the British Museum (Natural History). Part IV. Containing the orders Anomodontia, Ecuadata, Caudata, and Labyrinthodontia; and supplement.* London: Printed by order of the Trustees, xxiii, 295 pp. (The supplement records the following additional items from the Dawson Collection, all from the Wadhurst Clay of Sussex: *Iguanodon dawsoni*, Lydekker, from Brede, purchased 1889, pp. 259–260; *Iguanodon fittoni*, Lydekker, from Shornden, purchased 1889, pp. 260–261; *Iguanodon hollingtoniensis*, Lydekker, from Hollington quarry, purchased 1889, pp. 262–264; undetermined specimens from Hollington and Shornden, and from the Ashdown Sand at Ecclesbourne, purchased 1889, pp. 264–265. Farrant (2013, 150) records that Dawson sent further small instalments of dinosaurian remains to the museum in 1892, 1894, 1898, 1909 and 1912.)

Lydekker, R. 1893. On a mammalian incisor from the Wealden of Hastings. *Quarterly Journal of the Geological Society of London*, **49** (3), 281–283 (with discuss). (Hitherto the only evidence of the existence of mammals in the English Wealden had been afforded by the tooth of *Plagiaulax*, found by Charles Dawson in the Wadhurst Clay near Hastings and described by Smith Woodward in 1891. An incisor of another Wealden mammal had now been identified from a loose block of ‘Tilgate Grit’ found by Sir John Evans at Hastings in about 1854. The author assigns the new tooth to the rodent-like genus *Bolodon*, which had previously only been found in the Purbeck. In the discussion which followed the reading of this paper, Dawson expressed doubt as to whether the loose block was of local origin, and he did not recognise the tooth as mammalian. A re-examination by Clemens 1963 attributes the tooth to a rodent mammal, but concurs with Dawson’s view that it is not from the Wealden of Hastings, being most probably of Tertiary age.)

Lyne, W. C. 1916. The significance of the radiographs of the Piltdown teeth. *Proceedings of the Royal Society of Medicine*, **9** (3) odontol sect, 33–62 (with discuss). (Notes that the heavy wear exhibited by the Piltdown canine is out of keeping with its immaturity as indicated by the large size of its pulp cavity, which is revealed in the radiographs published by Underwood 1913a. He likens the pulp cavity to that of a young orangutan. Other incongruities are also noted. A Birmingham dentist by profession, W. Courtney Lyne had examined the Piltdown material at the NHM in Dec 1913 and had been in correspondence with Woodward on the subject in Mar 1914 and Feb 1915 (Spencer 1990b, 104–105, 122). His paper was communicated to the Society on 24 Jan 1916, but his highly relevant criticisms, made in the presence of Woodward, Keith, Underwood, Elliott Smith and Pycraft among others, were rebutted by each of the defendants. His observations were disregarded until rediscovered in 1953–55. See Spencer 1990a, 93–96, for discussion.)

MacCurdy, G. G. 1910. Recent discoveries bearing on the antiquity of man in Europe. *Annual Report of the Board of Regents of the Smithsonian Institution*, for year ending June 30, 1909, 531–583, plates 1–18. (A useful review of the state of knowledge concerning the antiquity of man in Europe up to 6 April 1910, i.e. the period between Dawson’s first Piltdown find in 1908 and further purported discoveries in 1911.)

MacCurdy, G. G. 1913a. The significance of the Piltdown skull. *American Journal of Science*, ser. 4, **35**, no. 207 (Mar), 315–320. (‘Mr. Dawson and his associates are to be commended for the exercise of a diligent patience worthy of Darwin himself. The first piece was found about the time Schoetensack announced his discovery of the Heidelberg jaw. Mr. Dawson simply kept quiet and continued his search for more evidence.’ [Presumably no irony intended here]. ‘Both skull and jaw came from about four feet below the surface and not far apart, so that both probably belong to the same individual.’)

MacCurdy, G. G. 1913b. Ancestor hunting: the significance of the Piltdown skull. *American Anthropologist*, new ser., **15** (Apr–June), 248–256, plates VII–XI. (Not seen)

MacCurdy, G. G. 1914. The man of Piltdown. *American Anthropologist*, new ser, **16**, 331–336; also *Science*, **40**, 158–160. (A review of the findings to date. At this stage the author does not question the association of the skull, jaw and canine.)

MacCurdy, G. G. 1916. The revision of *Eoanthropus dawsoni*. *Science*, **43**, 228–231. ('The prehistoric archaeologist sometimes uncovers strange bedfellows; no other discovery is quite so remarkable in this respect as the assemblage from the now famous gravel pit at Piltdown Common, Sussex, England. Nature has set many a trap for the scientist; but here at Piltdown, she outdid herself in the concatenation of pitfalls left behind. Parts of a human skull, half an ape-like lower jaw, a canine tooth also ape-like, flints of pre-Chellean type, fossil animal remains, some referable to the Pliocene, others evidently Pleistocene; all at least as old as the gravel bed, some of the elements apparently derived from a still older deposit.' The author considers that, viewed independently, the Piltdown jaw and skull are clearly unrelated. Thus, 'in place of *Eoanthropus dawsoni* we have two individuals belonging to different genera, namely: (1) *Homo dawsoni*, and (2) *Troglodytes dawsoni* as suggested by Boule, or *Pan vetus*, sp. nov., if we adopt Miller's nomenclature.')

MacCurdy, G. G. 1924. *Human origins: a manual of prehistory. Volume 1. The Old Stone Age and the dawn of man and his arts*. New York & London: D. Appleton and Co, xxxviii, 440 pp. (Piltdown Man, pp. 305, 323–340, 435. Emphasises the lack of harmony between the jaw and skull, which is further obscured in the former by the missing articular condyle and the incompleteness of the chin region. In spite of recent British assertions that the jaw demonstrates hitherto overlooked human features, the validity of *Eoanthropus* as a genus is considered to be still unproven.)

Mantell, G. A. 1833. *The geology of the south-east of England*. London: Longman, Rees, Orme, Brown, Green, & Longman, xix, 415 pp, [7] plates. ('The gravel-pits (as they are called) of Barcombe are part of a ridge of broken chalk flints, slightly rolled, resting upon an eminence of the Weald clay. These flints are of various shades of yellow, brown, and carnelian... These flints are not reduced to the state of pebbles, much less of gravel, but are merely broken, and the sharpness of their angles worn away: they offer one of the few examples of a bed of partially rolled chalk flints lying at a distance from the chalk escarpment. At Isfield, Little Horsted, Barcombe, Wellingham, &c., the surface of the Weald clay, Iron sand, and Green sand, is covered with beds of gravel, composed of water-worn fragments of *sandstone* and *ironstone*, which in some instances are consolidated into a coarse aggregate, and are evidently the detritus of the upper beds of the Hastings sand formation. A considerable bed of it occurs in the parish of Barcombe, near the Anchor...' (pp. 28–29). In describing the organic remains of these 'Diluvial' deposits, Mantell notes the rare occurrence in Sussex of 'the bones and teeth of the horse, ox, deer, and elephant' (pp. 41–43). No such occurrences are noted at Barcombe, although the presence of elephant here has been mentioned by all writers since Austen 1851 (e.g. Lake *et al.* 1987), possibly in error (see note under Godwin-Austen). Mantell's account is largely carried over from his earlier work of 1822, *The fossils of the South Downs*, pp. 276, 283–284.)

Marks, J. 1988. Book review: [*The Piltdown Inquest*, by Charles Blinderman]. *Journal of Human Evolution*, **17**, 799–801. (Cited in Turrittin 2006)

Marks, J. 1992. Book reviews: *Piltdown: A Scientific Forgery* [&] *The Piltdown Papers*, by Frank Spencer. *American Journal of Physical Anthropology*, **87** (3), 376–380. (The writer does not find the case against Arthur Keith to be a very convincing one. 'In Keith's defense we have the fact that he reconstructed the skull poorly and then engaged in a protracted and bitter dispute over the proper manner of reconstructing it. If he in fact perpetrated the fraud himself, it is difficult to imagine him being so absentminded as to have forgotten what it originally looked like!' The reviewer asks why so many experts insisted that the jaw belonged to a chimpanzee and failed to attribute it correctly to an orangutan. Most of these experts had to contend with casts, yet Hrdlička, who examined the original specimens, saw human characteristics in the jaw! Marks has some interesting and pertinent things to say about the nature of science, and how scientists act and think. His final thought is to ask what would have happened if the fraud had been discovered promptly, and the perpetrator identified: 'Frankly, I would bet that if the perpetrator of Piltdown had been nailed, s/he would have gotten off Scotfree, especially if it had been someone prominent such as Arthur Keith (who was already a Scot)...')

Marks, P. 1987. *Skullduggery*. New York: Carroll & Graf Publishers, 284 pp. (A novel, based on the Piltdown forgery, which, to quote Tom Turrittin, 'depicts fictional accounts of the personal lives of scientists such as K. P. Oakley and A. S. Woodward, occasionally focusing more on their sexual fantasies and proclivities than on the subject of Piltdown Man'. See review by McGrath 1987)

Marriott, R. A. 1916. The bearing of early stone implements on the stages of man's progress. *Knowledge*, **39**, no. 577, 153–157. (Marriott was an enthusiastic supporter of eoliths)

Marriott, R. A. (Reginald Adam Marriott, a retired army Major living in Lewes, devoted much of his spare time to Wealden geology and archaeology. Marriott was on friendly terms with several prominent figures connected with the Piltdown controversy, including Dawson and Keith. Weiner records that Marriott, who died in 1930, had often told his family that he believed Piltdown man to be a fraud (Weiner 1955b, 164; Spencer 1990b, 225). It seems that Weiner had considered the possibility of Marriott's involvement in the fraud as the source of the radioactive elephant molars (Spencer 1990a, 151), but could find no evidence to corroborate this.)

Marston, A. T. 1936a. Chimpanzee or man? The Piltdown canine tooth and mandible versus the human specific characteristics of the straight canine and the fused alveolar-maxillo-premaxillary suture. *British Dental Journal*, **61** (June), 216–221. (Not seen)

Marston, A. T. 1936b. Preliminary note on a new fossil human skull from Swanscombe, Kent. *Nature*, **138** (1 Aug), 200–201. ('In June 1935, a fossilized human occipital bone was found *in situ* at a depth of 24 ft. below the surface, in the middle gravels of the Thames 100-ft. terrace at Swanscombe, Kent, in association with implements of the Acheulian culture phase. A note on the discovery appeared in *NATURE* of October 19, 1935, p. 637. In March 1936, at the same depth, and in the same seam of gravel, the left parietal bone of the same skull was discovered... In its relation to other fossil types, the Swanscombe skull is to be regarded definitely as a precursor of the Piltdown type.' A detailed comparison is made with Piltdown, and it is concluded that 'The anatomical features of the two skulls points to a definitely more primitive status for the Swanscombe skull than for Piltdown.')

Marston, A. T. 1936c. Observations on the Piltdown canine tooth. *British Dental Journal*, **61**, 595–569; see also 728–729. (Not seen)

Marston, A. T. 1936d. The teeth of prehistoric man. *British Dental Journal*, **61**, 595–569. (Not seen)

Marston, A. T. 1937a. The case for the Piltdown jaw. *Discovery* (London), **18** (Jan), 13–15. (Not seen)

Marston, A. T. 1937b. The Swanscombe skull. *Journal of the Royal Anthropological Institute*, **67** (Jul–Dec), 339–406, plates XLVI–LI. (Marston's formal monograph on this significant find from the 100-foot terrace of the Thames. Detailed comparisons are made with Piltdown, pp. 386–404, from which he concludes that the new fossil is geologically older. Marston had by this time been made aware by K. P. Oakley (p. 394) that the Piltdown gravel correlates with the much younger 50-foot terrace of the Thames. See Edmunds 1954.)

Marston, A. T. 1946. Piltdown Man: with special reference to the ape mandible and canine tooth. *Geologists' Association Circular*, no. 483, 1. (Abstract of a paper to be read before the Association on 5 July; also cited in Marston 1950b)

Marston, A. T. 1950a. [Comments on the Piltdown canine, molars and mandible.] *Abstracts of the Proceedings of the Geological Society of London*, no. 1457 (13 Jan), 30–31. (Report of presentation made 14 Dec 1949, which followed a presentation by K. P. Oakley. Marston showed lantern-slides to illustrate his attempt to mount a cast of the Piltdown canine into the upper canine socket of a female orangutan, where it fitted more comfortably and thus indicated that it belonged to an ape. Radiographs of the canine indicated an immature tooth 'which, if considered human, would represent the age of 13–14 years only, whereas the age of the Piltdown skull as judged by the obliteration of its sutures would be not less than 40 years. Clearly these could not belong to the same head.' He showed vertical sections through the mandible between the first molar and second premolar in fossil and recent man, in apes and in the Piltdown jaw. The examples were *Sinanthropus* child, *Sinanthropus* adult, Heidelberg, modern man, chimpanzee, female orangutan and male orangutan, from which he concluded that 'The Piltdown section curved inwards precisely as in the female orang and showed that the mandible belonged to an ape and not to the human group.')

Marston, A. T. 1950b. The relative ages of the Swanscombe and Piltdown skulls, with special reference to the results of the fluorine estimation tests. *British Dental Journal*, **88**, 2 June, 292–299. (With respect to the recent findings of the fluorine estimation tests, the writer notes that the low fluorine content of the cranial bones 'occasions no surprise. But what does occasion surprise is that the ape mandible and canine tooth is said to share with the cranium the same low fluorine content.' Some correspondence followed: *ibid*, **88**, 334; **89** (1950), 21–22, 48, 80, 110.)

Marston, A. T. 1952. Reasons why the Piltdown canine tooth and mandible could not belong to Piltdown man. *British Dental Journal*, **93**, (1), 1–13. (Argues that the Piltdown canine and jaw belong to an ape)

Marston, A. T. 1953. Goodbye to the “missing link”. *Picture Post*, **61** (12), 19 Dec. (Insists that Piltdown is not a fake. Marston takes a typically combative and rather abusive stand. Not seen.)

Marston, A. T. 1954a. [Piltdown and artificial staining of flints.] *Proceedings of the Geological Society of London*, no. 1508 (31 Mar), xlv-xlvi. (Report of a presentation made 24 Feb 1954, in which Marston described and exhibited examples of artificially stained flints using chromic acid and potassium dichromate. He refused to accept that flint E.606 from Piltdown had been fraudulently stained with chromate. See Oakley 1954b)

Marston, A. T. 1954b. Comments on ‘The Solution of the Piltdown Problem’. *Proceedings of the Royal Society of Medicine*, **47**, 100–102; also *ibid.*, **48**, 1955, 992. (Marston steadfastly refused to believe that Piltdown Man was a forgery. Not seen.)

Marston, A. T. 1954c. The treatment of ancient and modern bones with potassium dichromate, and its bearing on the Piltdown problem; and ape mandibular movement as the cause of wear on the Piltdown teeth. *Proceedings of the Geological Society of London*, no. 1514, cxiv–cxv. (Report of a presentation made at a meeting on 2 June 1954, at which Marston, the first speaker, set out to disprove the claim that the Piltdown jaw, canine and flint E.606 are fraudulent. ‘The charges of faking ought not to have been made. Those who made them knew that he (Mr. Marston) had proved, as long ago as 1936, that the Piltdown jaw and canine tooth were those of an ape and could not belong to any human skull.’ Gavin de Beer, Director of the Natural History Museum, then introduced a series of presentations demonstrating the application of new investigative techniques to the Piltdown assemblage, which comprehensively demolished Marston’s arguments. ‘That a hoax amounting to a fraud was perpetrated was no longer open to question, but it was not known who had done it.’ Presentations were made by Le Gros Clark, Weiner, Bowie & Davidson, Claringbull & Hey, Oakley, and Edmunds.)

Marston, A. T. 1959 (see Smith, A. 1959)

Marston, A. T. (see also under Anon. 1953d, 1954c, Oakley 1948, Weiner 1954a; Turrittin 2006 lists papers from the *Dental Record*, Jan 1954, and *British Dental Journal*, 2 Feb & 16 Mar 1954, 20 Sept 1955. For a biographical account see Turrittin 2004; for an obituary by a close friend see Carreck 1973.)

Martin, E. A. 1914 (contribution to discussion in Dawson & Woodward 1914b, in which, respecting the bone implement, he drew ‘attention to certain marks leading from the perforation, which seemed to show that a thong had passed through the hole, and had been bound tightly around the bone. The thong-marks suggested that the pointed end of the bone was that by which it was held, and that its purpose was that of a club.’)

Martin, E. A. 1917. Skulls and jaws of ancient man, and his implements. *South-Eastern Naturalist*, **22**, 23–37. (Including remarks on the Piltdown finds: paper read during a visit to the Natural History Museum by delegates of the Annual Congress of the South-Eastern Union of Scientific Societies, where they were able to examine the original Piltdown specimens under the guidance of Smith Woodward, reported *ibid.*, p. lxi)

Martin, E. A. 1943. The earliest men in Sussex: significance of the Piltdown skull. *Sussex County Magazine*, **17** (11), 310–311.

Mather, K. F. 1955. [Book review:] The Piltdown Forgery, by J. S. Weiner. *American Scientist*, **43** (3) July. (‘The end of Piltdown man is the end of the most troubled chapter in human paleontology... This book records the battery of research which has been necessary since July 1953 to prove that Piltdown was the most complicated forgery, the greatest hoax of modern times... The whole story is reviewed as to its details and all the personalities involved in such a manner that the book reads like a detective story.’)

Matsumoto, H. 1918. On a new archetypal fossil elephant from Mt. Tomuro, Kaga. *Science Reports of the Tôhoku Imperial University, Series 2, Geology*, **3** (2), 51–60, plate XX. (Including observations on Smith Woodward’s ‘*Stegodon* sp.’ from Piltdown, which, like Freudenberg 1915, he is inclined to refer to *Elephas* cf. *planifrons*, while he considers that Woodward’s *Mastodon* sp. may probably be referred to *M. arvernensis*, pp. 55–56.)

Matthew, W. D. 1915. Climate and evolution. *Annals of the New York Academy of Sciences*, **24** (1), 171–318; 2nd ed. 1939, Special Publication, New York Academy of Sciences.

Matthew, W. D. 1916. Note on the association of the Piltdown skull and jaw. Appendix B in Gregory 1916a. *Bulletin of the American Museum of Natural History*, **35**, 348–350. (Does not accept an association)

Matthew, W. D., Eastman, C. R. & Gregory, W. K. 1916. Recent progress in vertebrate paleontology. *Science*, **43** (21 Jan), 103–110. (Including a discussion, by Matthew, of the Piltdown skull and jaw, pp. 107–108, which entirely supports G. S. Miller’s conclusions that the latter belongs to a chimpanzee. ‘It is hardly to be expected, however, that this conclusion will be readily accepted by the European writers, who have with few exceptions committed themselves more or less deeply to the opposite view.’ This is not strictly true, see for example Giuffrida-Ruggeri 1917.)

Matthews, L. H. 1981. Piltdown man: the missing links. *New Scientist*, **90**: (30 Apr), 280–282; (7 May), 376; (14 May), 450; (21 May), 515–516; (28 May), 578–579; (4 Jun), 647–648; (11 Jun), 710–711; (18 Jun), 785; (25 Jun), 861–862; **91** (2 Jul), 26–28. (This interpretation of events at Piltdown reads largely as a work of fiction in which Dawson, starting with an old primitive-looking skull given to him in 1906 by a Mr Burley of Nutley, near Piltdown, attempts with the help of Lewis Abbott to construct a hypothetical assemblage of the same age as Heidelberg Man, including a faked jaw. In submitting part of the skull to Smith Woodward, and having convinced himself that it had been found at Piltdown, Dawson overstates his case by including a hippo tooth given him by Teilhard de Chardin. He is subsequently obliged to plant evidence when the site itself fails to yield any finds. Teilhard, it seems, suspects a deception, as does Martin Hinton, a voluntary worker at the NHM, and the two conspire to plant the canine tooth in order to warn off Dawson. This fails, and Hinton alone then plants the bone implement, with the same negative result. Also implicated through having had knowledge of Hinton’s complicity is C. P. Chatwin, an assistant at the NHM, who later worked for the Geological Survey. Harrison Matthews evidently knew Hinton well during the period 1945–51, but admits that although Hinton was dismissive of Piltdown, nothing of substance was ever said on the subject. The series of papers prompted reactions from Costello 1981b, Oakley 1981, and Townshend 1981. Charles Blinderman (1986, 148–153) concludes that Harrison’s thesis ‘is all so comical one wishes it were true.’ In the wider context of Piltdown sleuthing, the present Compiler can only agree with Blinderman’s statement that ‘we have often seen that the talented historian can make a case out of shreds. The really creative historian can make up the shreds themselves.’)

Maureille, B. 1990. Onze suspects pour deux coupables ou un résumé de “The new and shocking revelations about the Piltdown Forgery.” *Bulletin trimestriel, Société d’Anthropologie du Sud-Ouest*, **25** (4), 213–222. (Not seen, but is evidently a response to the Spencer/Tobias case against Arthur Keith)

Maxwell, J. 2012. *Piltdown Man and other hoaxes: a book about lies, legends, and the search for the missing link*. American Book Publishing, 248 pp. (Not seen)

McCann, A. W. 1922. *God—or gorilla: how the monkey theory of evolution exposes its own methods, refutes its own principles, denies its own inferences, disproves its own case*. New York: Devin-Adair Co, 340 pp. (Including chapters on: Making the Piltdown Man; The Trinil Ape Man; Neanderthal Man; The Gibraltar Man; etc. Not seen.)

McCann, T. 1981. Charles Dawson and the Lavant Caves. *Sussex Archaeological Society Newsletter*, no. 33 (Apr), 234. (Charles Dawson and John Lewis carried out a detailed excavation of the Lavant Caves, at the request and at the expense of the 6th Duke of Richmond, shortly after the discovery in 1890 of subterranean passages cut into the Chalk at Hayes Down, East Lavant, near Chichester. The excavation was undertaken during 1893, but the only published account that appeared was a report in the *Sussex Daily News* of 11 Aug 1893 based on a presentation by Dawson to the Sussex Archaeological Society. [This statement is incorrect; a report of the excavation appeared in the *West Sussex Gazette* of 2 Mar: see Dawson 1893c.] A number of roof collapses forced the abandonment of the excavation, with the result that no official report was published. A manuscript report does however survive in the West Sussex Record Office at Chichester, the content of which is here briefly summarised. There are aspects of the affair, such as the suspicious nature of the few artefacts found, that are considered to reflect badly on Dawson: see in particular Allcroft 1916, Russell 1999, Russell 2003, 33–41. Clinch 1905 includes a plan of the workings supplied by Lewis. See also Holden 1981, McCann 1997, Farrant 2013. For a record of finds from the excavation see Hewitt, H. D. 1955, reproduced in Russell 2003, 271–2. Farrant 2013, 162, records that in 2008 the finds could not be located in Chichester Museum’s store at Fishbourne.)

McCann, T. J. 1997. The Lavant Caves revisited. *Sussex Archaeological Collections*, **135**, 311. (The writer has discovered a diary record of a visit to the Lavant Caves undertaken on 10 Mar 1893, by Mary Wyndham, the daughter of the 2nd Lord Leconfield, which is quoted. She notes, reflecting the view of Charles Dawson, that ‘It is supposed to have been inhabited by ancient Britons, & a few ornaments have been found.’ Allcroft 1916 suggested that the site had been a flint mine, but the modern view (Russell 2003, 38) is that it is the result of post-medieval chalk extraction.)

McCulloch, W. 1981. Some remarks on Teilhard and the Piltdown hoax. *Teilhard Newsletter*, **14** (1), 1–2, 4. (A response to Gould's assertion of Teilhard de Chardin's complicity in the Piltdown affair. Gould enlisted the views of the late L. S. B. Leakey in his argument, but the writer points out that Leakey could never discover any evidence to support his suspicion, as is clear from a letter addressed to Oakley in Sept 1972, just a month before his death. After dealing with each of Gould's arguments, the writer concludes that what Gould calls his 'complex hypothesis' is contradicted by basic facts.)

McCulloch, W. 1983. A reader's guide to S. J. Gould's Piltdown argument. *Teilhard Newsletter*, no. 16, Dec, 4–7. (The writer thinks that 'Gould's method of presenting his main argument might be called *inferred intent*—projecting onto Teilhard ways of thinking and acting that have no evidential base and are completely foreign to all we know of Teilhard. With Gould it seems that the guilty verdict came first, then he created a persona to fit the crime... Gould's convoluted scenario was wrapped in the trappings of a scientist with special palaeontological knowledge and scientific judgement. But I submit that his persistent attempts to involve Teilhard—though under criticism he has had to consistently weaken his stance—are highly subjective.' The writer goes on to identify specific weaknesses in some of Gould's arguments and in his response to criticism. In regard to the latter, 'It is obvious that Gould brooks no criticism. For the discerning reader, it is another of his games: setting the stage with himself as hero and his critics caricatured as fanatics or tolerated as ineffectuals... Gould complains that his critics do not take his arguments seriously. But many have spent a great deal of time in answering him. He is the one who refuses to meet any standard of serious discourse. It is like trying to play a game with someone who continuously changes the rules as he goes along and refuses to acknowledge a win by anyone else... Gould's motive? He tells us himself: he is an iconoclast. The "implicit pattern" in his writings is the need to topple those he feels are too venerated... A remark of Gould's appeared in *Time* magazine (May 30, 1983, p. 41): "If I have one special ability, it is as a tangential thinker. I can make unusual connections." But such connections do not necessarily make sense.')

McCulloch, W. 1987. [Blinderman – McCulloch exchange]. *Teilhard Newsletter*, no. 20, Aug, 10. (This short exchange concerns the perceived attitude of Stephen J. Gould towards Teilhard de Chardin)

McCulloch, W. 1996. Teilhard de Chardin and the Piltdown hoax. *Teilhard Studies*, no. 33, 23 pp. (Not seen)

McGrath, P. 1987. Book review: [Peter Marks, *Skulduggery*]. *New York Times Book Review*, 23 Aug, 7.11. (See reaction from Blinderman 1987. Cited in Turrittin 2006)

McNabb, J. 2007. The lying stones of Sussex: an investigation into the role of the flint tools in the development of the Piltdown forgery. *Archaeological Journal*, **163**, for 2006, 1–41. (A detailed examination of the flint finds from Piltdown leads to the conclusion that the forger did not originally intend to continue activity at Barkham Manor beyond the 1912 field season, but a need to silence the critics and put the interpretation back on track demanded further 'salting of the mine'. The 1913 field season was notable for yielding flints that arguably displayed features transitional in form between an eolith and a palaeolith, thus strengthening the Dawson/Woodward case for *Eoanthropus* pre-dating the earliest Palaeolithic or Chellean culture. The bone implement or 'cricket bat', found in 1914, is also described. The writer does not believe the NHM view (expressed by Andrew Currant in a personal communication) that this implement was introduced by someone else as a warning to the forger that the game was up. No work was undertaken at Barkham Manor in 1915, probably because of the war, but Dawson came up with a second individual of *Eoanthropus*, from a field near Sheffield Park, which effectively silenced many of the critics because it demonstrated that the much disputed association of ape jaw and human skull at Piltdown was not just a freak occurrence. Woodward returned to Barkham Manor in 1916 (Dawson was too ill to accompany him), but found only a battered flint nodule, which he termed a 'hammer stone'. Dawson died on 10 Aug 1916, after which no significant finds were made in the Piltdown gravel. The writer leaves open the question of who the Piltdown forger might have been. The 'lying stones' of the title alludes to a celebrated hoax from the early 18th century which, like Piltdown, is often described as one of the most famous hoaxes in the history of science: for an excellent and full account of this bizarre affair see Jahn & Woolf 1963.)

Medawar, P. 1963. Is the scientific paper a fraud? *The Listener*, 12 Sept, 377–378. (The writer/presenter suggests that, in their presentation of methodology and results, scientists 'tidy-up' the messy business of hypothesis, experiment and interpretation. Citing this radio talk, Paul Graves (1992) goes on to say that 'there is a sense in which all scientific argument is at least *selective* in its presentation of the facts. In the now famous phrase of one diplomat, all scientists can be "economical with the truth" when it suits them.')

Medawar, P. 1983. The phenomenon of man. In: *Pluto's Republic, incorporating The art of the soluble and Induction and intuition in scientific thought* / by P. Medawar. Oxford: Oxford University Press, pp. 242–251. (Includes an examination of the Piltdown fraud, and in respect of Teilhard's involvement concludes that

‘Teilhard was guilty of an innocence which makes it easy to understand why the forger of the Piltdown skull chose him to be the discoverer of its canine tooth.’ Cited in McCulloch 1983.)

Mennell, F. P. (contribution to discussion in Dawson & Woodward 1914b: with reference to the Piltdown bone implement ‘Mr. F. P. Mennell said that experience in countries where elephants were still plentiful showed that the bones began to weather rapidly as soon as the flesh had decayed away. There was consequently no difficulty in detaching pieces from such bones, but they were usually so splintery and even friable, that they were unsuitable for any kind of serviceable implement. It seemed to him very remarkable that so primitive a being as *Eoanthropus* should be capable of making and using any implements at all.’)

Meunier, V. 1900. *Les ancêtres d’Adam: histoire de l’homme fossile*. Paris: Librairie Fischbacher, xxxiv, 312 pp. (Mainly a critical review of the writings of Boucher de Perthes, and especially of the *Antiquités celtiques et antédiluviennes*. Millar 1972 states that this work was originally submitted for publication in 1875 but was withdrawn because its account of ‘the martyrdom of Boucher de Perthes’ at the hands of the Académie de Sciences was deemed offensive.)

Miles, A. E. W. 1991. Book review: [*Piltdown: a scientific forgery*, by F. Spencer]. *International Journal of Osteoarchaeology*, **1** (1), 67–70. (Not seen)

Miles, H. 2003. The men behind the scam. *Sunday Times Magazine*, 26 Oct, 20–21, 23, 25, 27–29. (In 1975 Kenneth Oakley revealed to Prof Vernon Reynolds his conviction that the Piltdown ‘hoax’ had involved C. P. Chatwin and Martin Hinton, both of whom at the time were working under the authoritarian Smith Woodward at the Natural History Museum. They had undertaken the hoax, presumably in league with Dawson, as a vengeful prank. Chatwin later joined the staff of the Geological Survey. The article includes comments from Professor Geoffrey Harrison. Professor Joe Weiner, who first revealed the fraud, was the present author’s grandfather. See also remarks under Chatwin.)

Miles, J. 1953. Open letter from Piltdown Man. *The Listener*, **50** (3 Dec), 952. (A light-hearted poem)

Miles, P. 1993. The Piltdown Man and the Norman Conquest: working volumes and printer’s copy for Charles Dawson’s *The History of Hastings Castle*. *Studies in Bibliography*, **46**, 357–370. (Reports the finding of a small cache of books recovered more than twenty years ago in builder’s waste derived from an Uckfield storeroom with a remote association to Charles Dawson. The books had once formed part of Dawson’s library.)

Miles, P. 2007. Charles Dawson’s rare essay on the Hermitage at Buxted. *Sussex Archaeological Collections*, **145**, 195–209. (Dating from about 1902, this article appeared as an appendix to an album of photographs which is known from only four copies. Not seen)

Millar, R. 1972. *The Piltdown men*. London: Victor Gollancz, 264 pp, 8 plates. (A large part of the book is taken up by a general historical overview of scientific debate on evolution and human origins. This is very readable but was considered overly long by some critics of the work. The author had corresponded with Le Gros Clark and Oakley, whose responses to a number of queries are included. The most contentious part of the book occurs in the final few pages (233–37) where he accuses Grafton Elliot Smith of being the forger. His evidence is entirely circumstantial, based on little more than a personal conviction that ‘Somehow the whole affair reeks of Smith.’ Millar claims that Oakley was prepared to go along his theory about Smith’s involvement, but in a private communication to Charles Blinderman (1986, 220) Oakley stated that Millar ‘completely misrepresents me as supporting his absurd view that Elliot Smith might have perpetrated the Piltdown hoax.’ Millar’s work is riddled with small errors, as was noted by some reviewers. See Weiner 1973b for a professional estimation of the worth of Millar’s book. Also reviews by Anon. 1972a–b, Daniel 1972, Thuillier 1972, Zuckerman, S. 1972, Krogman 1973. For other reviews and reactions see Turrittin 2006, 25)

Millar, R. 1998. *The Piltdown mystery: the story behind the world’s greatest archaeological hoax*. Seaford: SB Publications, 79 pp. (A slimmed down version of Millar 1972, omitting the historical prologue that occupied about half of the earlier work. He still considers Dawson to be innocent, but now thinks that Teilhard de Chardin may have been the perpetrator, assisted perhaps by his companion Félix Pelletier, who had a knowledge of chemistry. Includes an added note on Barkham Manor Vineyards, Appendix 1: Wine and Piltdown man. Mark Lambert, the owner, has a range of wines from the cheapest Piltdown Man to the more expensive Barkham Manor Elegance.)

Miller, G. S. 1915. The jaw of the Piltdown man. *Smithsonian Miscellaneous Collections*, **65** (12), 31 pp, 5 plates. (Based on comparative analysis of the jaws of more than a hundred chimpanzee, orangutan and gorilla, the author concludes that the Piltdown jaw is distinct from the skull and seems to belong to a new fossil form of chimpanzee, which he names *Pan vetus*. Includes an annotated bibliography.)

Miller, G. S. 1918. The Piltdown jaw. *American Journal of Physical Anthropology*, **1** (1), 25–52, plates 1–4. (With supplemental annotated bibliography. Not seen)

Miller, G. S. 1920. Conflicting views on the problem of man's ancestry. *American Journal of Physical Anthropology*, **3** (2), 213–245. (General discussion)

Miller, G. S. 1929. The controversy over human "missing links." *Smithsonian Institute Report*, for 1928, 413–465, 5 plates. (In a general review of the controversy surrounding the Piltdown finds, the author lists no fewer than twenty points of disagreement between the principal authors involved in the debate, pp. 432–445, 457–465, plates IV–V.)

Miller, G. S. (see also Oakley & Groves 1970)

Milner, R. 1990. *The encyclopedia of evolution: humanity's search for its origins*. New York: Facts on File, 481 pp. (Includes entries on *The Lost World*, pp. 281–282, and Piltdown Man, pp. 363–365)

Milner, R. (see also Anderson 1997, Highfield 1997, Gornall 2003a)

Mitchell, P. C. 1915. An application of the rules of zoological nomenclature. *Nature*, **96** (30 Dec), 480. (Criticises G. S. Miller's (1915) proposal under the rules to rename the Piltdown mandible *Pan vetis*. F. A. Bather in 1913 had likewise criticised Arthur Keith for a similar offence: Keith 1913c)

Moir, J. R. 1910. The discovery of the flint implements of pre-Crag man. *The Times*, 17 Oct, 8. ('It may be of interest to the scientific world to know that, after a series of investigations in the Pliocene strata of Ipswich and East Suffolk, I have managed to find indisputable evidence of pre-Crag man in the flint implements I have dug out from the base beds of many crag sections in this district... My discovery...means that our ideas of the antiquity of man must be somewhat altered, as these specimens, though of such an extreme antiquity, exhibit a knowledge of flint chipping far in advance of any Eolithic work, and the question arises, as this is so, to what period the Eoliths belong.' See Moir 1911 for a formal presentation of his discovery.)

Moir, J. R. 1911. The flints implements of sub-Crag man. *Proceedings of the Prehistoric Society of East Anglia*, **1** (1), 17–43, plates I–VII. (Paper read 23 March 1910. The writer has found what he regards as flint implements in deposits of Pliocene age in a brickfield near Ipswich. 'The acceptance of some of these flaked flints one would imagine could not be refused, as their workmanship and intention is identical with the universally-accepted palaeoliths; but there are some, amongst whom I may mention Professor Boyd Dawkins and Mr. Hazzeldine Warren, who after seeing my specimens when on exhibition at Burlington House, London, told me that they were undoubtedly the result of natural forces and nothing else.')

Moir, J. R. 1912a. The natural fracture of flint and its bearing upon rudimentary flint implements. *Proceedings of the Prehistoric Society of East Anglia*, **1** (2), 171–184. (Paper read 4 Dec 1911. 'The determination of human flaking as against Nature's work upon flints has always been a vexed question with archaeologists.' The writer goes on to briefly discuss Benjamin Harrison's Kentish eoliths. He believes that his discovery of rough 'implements' below the Red Crag in 1909 (Moir 1910, 1911) bridges the gap between the Eolithic and Palaeolithic cultures. He attempts here to 'put forward my views regarding the human origin of those rudimentary edge-chipped stones which are looked upon as man's first efforts in flint chipping.' This paper is followed by a counter argument from Haward 1912.)

Moir, J. R. 1912b. The occurrence of a human skeleton in a glacial deposit at Ipswich. *Proceedings of the Prehistoric Society of East Anglia*, **1** (2), 194–202, [2] plates. (Paper read 21 Feb 1912. The skeleton was found beneath compacted, decalcified Chalky Boulder Clay (considered to be of early Pleistocene date) in a sand pit near a brickyard, about a mile N of Ipswich, in Oct 1911. The bones, at about 3 feet (1 m) below the surface, were partly imbedded in the underlying stratified glacial sand. It was ascertained before removal that no grave had ever been dug on the spot before. The upper part of the skeleton was partly decalcified. Included in this account are reports from William Whitaker, who believes that the brown loam which completely fills the skull must have entered in a semi-liquid state [or slurry]; from John E. Marr, who suggests the possibility that the Boulder Clay has been remobilised; and from George Slater, giving further account of the geology of the site. Moir concludes that 'It has no doubt come as a surprise to many that this man, who is apparently so much more ancient than the Neanderthal men, should be of a modern type, while

the latter are very primitive.’ Referring to the Galley Hill skull from Kent (Newton 1895) he goes on to note that this find ‘has opened the eyes of anthropologists to the fact that modern man is much more ancient than we supposed, and this discovery at Ipswich proves that during one of the warm interludes of the Great Ice Period he was already evolved.’ See also Keith 1912a, and Moir & Keith 1912. For early reports of the discovery see Anon. 1912a–b. In 1916 Moir was obliged to admit, with commendable candour, that he had been wrong concerning the great age of these bones; this followed from his reinterpretation of the overlying ‘chalky boulder clay’: see Moir 1916.)

Moir, J. R. 1912c. The making of a rostro-carinate flint implement. *Nature*, **90** (21 Nov), 334. (The writer has succeeded in manufacturing flakes of rostro-carinate form from a potato-shaped nodule of flint, which he hopes ‘will convince archaeologists that we are dealing with a very complex type of implement, and that such a highly specialised tool cannot very well have been produced by unguided, haphazard natural forces.’)

Moir, J. R. 1912d. The Piltdown skull. *The Times*, 25 Dec, 8. (The writer had the opportunity to examine and handle the Piltdown skull, jaw and associated flint implements at the Natural History Museum some weeks prior to the formal announcement of the discovery at the Geological Society on 18 Dec. The human bones, eolithic flints and portions of teeth of Pliocene elephants are all stained red, whereas the ‘Chellean’ flints, or palaeoliths, are stained a lightish yellow. He believes therefore that the eolithic implements belong with the human remains, which thus dates Piltdown Man to the Pliocene. See letter from Moir to Smith Woodward, dated 12 Nov 1912, in Spencer 1990b, 31–32.)

Moir, J. R. 1912e. The natural fracture of flint. *Nature*, **90** (26 Dec), 461–463. (In an attempt to understand the effects of natural percussion and pressure on the fracturing of flint, and to enable a better understanding of what is human flaking upon any given stone, and what is not, the writer has for some time past carried out a series of experiments. ‘In order to provide conditions in which flints would strike each other fortuitously, I could think of no better plan than to get a large sack, and, placing eight or nine stones in it, shake it violently about for some considerable time, and afterwards observe whether any of the flints had been flaked in the process. For my experiments with pressure I used a converted letterpress and a differential screw-press, with which very considerable pressures were obtained.’ The results of these experiments are described at length.)

Moir, J. R. 1913a. A defence of the “humanity” of the pre-river valley implements of the Ipswich district. *Proceedings of the Prehistoric Society of East Anglia*, **1** (3), 368–374. (A response to objections raised as to the humanity of pre-Palaeolithic ‘implements’ described in earlier papers, e.g. Moir 1912a, 1912e.)

Moir, J. R. 1913b. Pre-Palaeolithic man. *Bedrock: A Quarterly Journal of Scientific Thought*, **2** (2) July, 165–176. (Not seen)

Moir, J. R. 1914. The Piltdown skull. *Antiquary*, **50** (Jan), 21–23. (A response to Dawkins 1913b. Partly quoted in Spencer 1990a, 83. Principally a discussion of the Piltdown ‘palaeoliths.’ Not seen.)

Moir, J. R. 1915a. On the further discoveries of flint implements of man beneath the base of the Red Crag of Suffolk. *Proceedings of the Prehistoric Society of East Anglia*, **2** (1), 12–31, plates I–VIII. (The writer affirms that, as a result of excavations beneath the base of the Red Crag, funded with a grant from the Royal Society, he has found indisputable evidence of a true Pliocene human culture.)

Moir, J. R. 1915b. A series of mineralised bone implements of a primitive type from below the base of the Red and Coralline Crag of Suffolk. *Proceedings of the Prehistoric Society of East Anglia*, **2** (1), 116–131, plates XXVI–XXXII. (Read 3 Mar 1915. Moir had written to Smith Woodward on this subject following the discovery of the Piltdown bone implement (Spencer 1990b, 116, letter dated 28 Nov 1914) but prior to its formal announcement at the Geological Society of London on 2 Dec 1914. Among the bone pieces illustrated in Moir’s article is an example bearing a remarkable resemblance to the Piltdown ‘cricket-bat’, being a ‘narrow, thin, flat specimen pointed at one end’ (plate XXVII), heavily mineralised and ‘artificially shaped’ from probably a portion of rib, though from what kind of animal is not stated. Assuming that the figures are reproduced at true scale (this also is not stated), the ‘implement’ would appear to be 13 cm in length and 3 cm in width. The writer asserts on the basis of experiment that the implements must have been carved from fresh unmineralised bone, since ‘mineralised specimens are quite unsuitable for such shaping.’)

Moir, J. R. 1915c. Human palaeontology in England. *Geological Magazine*, dec. 6, **2** (10), 476–478. (A response to Boule 1915. Marcellin Boule and Henri Breuil had at some time visited Moir in Suffolk. But it appears that neither gentleman had shown much interest in either Moir’s sub-Crag implements or the pit section where the Ipswich skeleton was found.)

Moir, J. R. 1916. Pre-boulder clay man. *Nature*, **98** (12 Oct), 109. (The author declares that recent work has now determined that the Ipswich skeleton, previously thought to predate the 'chalky boulder clay', is more likely to be of late Palaeolithic date. He now accepts that the material overlying the skeleton is the product of an original deposit of chalky boulder clay that had been reworked and re-deposited as a sludge in post-chalky boulder clay times. See Moir 1912 for a description of the original discovery, in which the suggestion of Marr, appended to that report, is now shown to have been essentially correct.)

Moir, J. R. 1918. Pre-Palaeolithic man in England. *Science Progress*, **12**, no. 47, 470–474. (Not seen)

Moir, J. R. [1919]. *Pre-Palaeolithic man*. Ipswich: W. E. Harrison; London: Simpkin, Marshall, Hamilton, Kent & Co, 67 pp, 29 plates. (This work is devoted to the subject of pre-Chellean flint implements and their evolution through eolithic and rostro-carinate forms to the earliest Palaeolithic flints. In respect of the Piltdown remains, pp. 63–67, he believes that 'There would not appear to be any valid geological reason why the lower stratum of the gravel at Piltdown should not be a Pliocene deposit overlain by gravelly strata of later date, and the author knows that such an association of beds of different ages occurs not infrequently in the valleys of East Anglia.' He further considers that the so-called 'palaeoliths' from Piltdown are pre-Palaeolithic in date, and draws attention to similar examples which have 'been found below the Pliocene Red Crag' such as that illustrated in plate 12 of the work.)

Moir, J. R. 1924. Tertiary man in England. *Natural History*, **24** (6), 636–654. ('It is the purpose of this article to give a description of some of the flaked flints of Pliocene age that have been found in England and that have convinced many competent observers that man existed in the Tertiary Period.' Deals with Kentish eoliths, the Suffolk Bone Bed, the sub-Crag implements, the Foxhall industry, the Cromer Forest Bed, fauna and implements. Appended is a note by Sir E. Ray Lankester, pp. 654–5, objecting to matters of nomenclature and terminology.)

Moir, J. R. 1938. The Piltdown bone implement. *Nature*, **141** (supplement, 21 May), 926. (With reference to the opinion of Breuil 1938 that the Piltdown bone implement is the result of gnawing by carnivores or rodents, the writer points out that he has successfully cut bone using flint tools, which produces the same kind of stepped fracture as that shown by the Piltdown implement. See also Woodward 1938)

Moir, J. R. [1939]. *The earliest men*. London: Macmillan & Co. Ltd, 32 pp.

Moir, J. R. & Keith, A. 1912. An account of the discovery and characters of a human skeleton found beneath a stratum of chalky boulder clay near Ipswich. *Journal of the Royal Anthropological Institute*, **42** (2), July-Dec, 345–379, plate XXX. (An expanded version of the accounts by Moir 1912b and Keith 1912a)

Moir, J. R. (for obituaries see Burkitt 1944, Keith 1944, and Boswell 1945. See also his correspondence with Smith Woodward in Spencer 1990b)

Molleson, T. (see under Farrar 1981, & Lowenstein *et al.* 1982)

Mollison, T. 1921. Die Abstammung des Menschen. *Die Naturwissenschaften*, **9**, 128–140. (Considers that the human cranium and ape jaw from Piltdown are incompatible, pp. 137–8. Not seen)

Mollison, T. 1924. Neure Funde und Untersuchungen fossiler Menschenaffen und Menschen. *Zeitschrift für Anatomie und Entwicklungsgeschichte*, **25**, 696–771. (Discussion of Piltdown, pp. 715–724, 736; assigns the jaw to *Pan vetus* after Miller 1915. Cited in Quenstedt 1936)

Montague, M. F. A. 1949 (see Oakley & Montague 1949)

Montagu, M. F. A. 1951a. The Barcombe Mills cranial remains. *American Journal of Physical Anthropology*, new ser, **9** (4), 417–426. ('In January, 1917, the Barcombe Mills remains were presented by Dr. F. Du Cane Godman to the Geological Department of the British Museum (Natural History) where they now rest. In the Museum Register the Barcombe Mills cranial remains are recorded as having been recovered from "Pleistocene gravel in field on top of hill above Barcombe Mills railway station." A molar tooth is recorded as "probably from the same place (not certain). A[rthur] S[mith] Woodward[]." The Barcombe Mills remains are described for the first time in this paper.' Further information will be found in Spencer 1990b, 143–4. Du Cane Godman acted on behalf of Dawson's widow.)

Montagu, M. F. A. 1951b. The Piltdown mandible and cranium. *American Journal of Physical Anthropology*, new ser, **9** (4), 464–470, plates 1–2. (Having had the opportunity to examine the original human remains from Piltdown, the writer has been greatly struck by the marked disparity in massiveness between the

Piltdown mandible and cranium, such as to make it highly improbable that the two belong together. This lack of morphological congruity had already been noted by Hrdlička in 1922.)

Montagu, M. F. A. 1954. The Piltdown nasal turbinate and bone implements: some questions. *Science*, **119** (18 June), 884–886. (Having examined the Piltdown bones in 1951, Prof. Montagu of the Department of Anthropology, Rutgers University, questions the presence of portions of a turbinate, which under normal circumstances is too fragile to survive in the fossil record. He also thinks that the alleged ‘bone implement’ was carved by ‘a sharp metal blade probably of the Sheffield steel variety’.)

Montagu, M. F. A. 1960a. *An introduction to physical anthropology*. 3rd ed. Springfield: Thomas Books. (The Piltdown hoax: reprinted in *The origin and evolution of man*, by the same author, 1971, pp. 211–215.)

Montagu, M. F. A. 1960b. Artificial thickening of bone and the Piltdown skull. *Nature*, **187** (9 July), 174. (Given the unusual thickness of the Piltdown skull, the writer suggests that immersion in potassium hydroxide or some other similar chemical treatment might have been employed by the forger to artificially thicken the skull. A reply by K. P. Oakley, which follows the correspondence from Montagu, states that there is no evidence for such treatment, but in the British Museum collections there are examples of other crania as thick as that from Piltdown, e.g. an Ona Indian from Tierra del Fuego, and a Bronze Age example from Sutton Courtenay in Berkshire.)

Moody, R. T. J. (compiler) 2012. ‘Piltdown – 100 years on’: *Geological Society London, Burlington House, Piccadilly, 18th December 2012: abstract book*. Printed booklet issued to delegates, [2], 23 pp; also issued electronically by the History of Geology Group, with different cover. (This meeting was held to mark the centenary of the reading of the Piltdown Man paper at the Geological Society of London on December 18th 1912, and was convened on behalf of The Geological Society of London, The History of Geology Group, and the Natural History Museum. Papers were presented by Carolyn Shindler, Anne O’Connor, David M. Martill, Miles Russell, Christopher Dean & Isabelle de Groote, Chris Stringer with Adrian Lister & Simon Parfitt; there were poster presentations by Colin Prosser, Graham Mullan, and Mat Pope.)

Moore, R. 1955. *Man, time and fossils: the story of evolution*. London: Readers Union, Jonathan Cape, 382 pp. (Ch. 17: Oakley – fluorine and the age of early man, pp. 304–323, 2 plates. After describing 19th-century observations on the absorption of fluorine by fossil bones and teeth, the author goes on to record how ‘two unrelated events during World War II revived interest in the old fluorine data. The Geological Survey of Great Britain undertook a survey of the phosphate resources of the country, and also a study of the effect of fluorinated water in reducing tooth decay in children.’ Kenneth Oakley was assigned to the work on temporary transfer from the Natural History Museum. As he delved into the history of fluorine in groundwater he saw how it might be applied to the relative dating of bones of different ages that might have become mixed together in the same deposit. See Eastwood & Oakley 1953)

Morell, V. 1995. *Ancestral passions: the Leakey family and the quest for humankind’s beginnings*. New York: Simon & Schuster. (Notes that Louis Leakey’s notes and unfinished book draft about Teilhard de Chardin’s supposed complicity in the Piltdown affair have been deposited in the archives of the National Museums of Kenya, pp. 378–379, 394. Not seen.)

Moriarty, J. 1983. Piltdown debate: not so elementary. *Science* **83**, **4** (9) Nov, 24. (‘I have just read, with no light interest, the case made against Sir Arthur C. Doyle in your September issue. Although Winslow and Meyer did a fine job of research, they are totally incorrect. Once more, I have succeeded!’)

Morris, H. 1929. An exhibit of Sussex flint implements of the Piltdown Man period. *South-Eastern Naturalist and Antiquary*, 34th Annual Congress, Brighton, June 1929, lxiii. (Notice only, recording ‘a large collection of flints arranged by Mr. H. Morris, with illustrations and correspondence.’)

Morris, H. (with respect to Harry Morris’s accusation of fraud made against Charles Dawson in connection with the Piltdown ‘palaeoliths’ see discussion in Weiner 1955b, 154–161, plate 9, and Spencer 1990b, 216–218. Walsh 1996, 85–87, 234, who examined the Morris notes at the Natural History Museum, provides some further clarification. An important customary error of transcription is corrected in Pitts 2004. It appears that Weiner had briefly considered Morris a possible suspect in the Piltdown fraud: see Spencer 1990a, 151.)

Mortillet, G. de 1883. *Le préhistorique: origine et antiquité de l’homme*. Paris: C. Reinwald, 642 pp. (The writer postulates the existence of a European Tertiary man-ape, to which he gives the name *Anthropopithecus*. To characterise its primitive industry and the period to which it belongs he has coined the term ‘Eolithique’ or Dawn Stone Age, pp. 301–2. Discussed in Spencer 1990a, 12.)

Morwood, M. & van Oosterzee, P. 2007. *A new human: the startling discovery and strange story of the "Hobbits" of Flores, Indonesia*. Washington: Smithsonian Books/HarpurCollins, 256 pp. ('In October 2004, a team of Australian and Indonesian anthropologists led by Mike Morwood and Radan Padji Soejono stunned the world with their announcement of the discovery of the first example of a new species of human, *Homo floresiensis*, which they nicknamed the 'Hobbit'. So says Prof. Morwood. Other scholars have raised serious concerns about the true antiquity and classification of the little chap. Piltdown casts its long shadow, and once again scientific method is called into question. See Henneberg *et al.* 2011)

Mullen, G. 2004. X-filed fossils. *British Archaeology*, no. 75 (Mar), 34. (A response to the article by Pitts 2004. The correspondent notes that the Piltdown canine tooth 'was treated completely unlike the other bones and teeth: this important part of the story is one of only four objects not found by Dawson or Smith Woodward. The bone implement is also quite unlike the rest of the assemblage. It is the only object that does not fit with then current archaeological thinking. It is easier to envisage a separate genesis and purpose for these items.')

Mullen, G. 2012. Piltdown: a developing story. In: *Piltdown – 100 years on, Geological Society London, Burlington House, Piccadilly, 18th December 2012: abstract book* / compiled by R. T. J. Moody, pp. 20–21. (Poster abstract. 'It is here argued that the scope and detailed purpose behind the forgeries changed over time, as Dawson reacted to events, the reactions and actions of others. Others were probably involved, but not as co-conspirators. It is possible that Dawson may have changed his original plan for the forgeries in response to Smith Woodward's reaction to the objects. The flint collection from Piltdown includes five or six Palaeoliths and 'Eoliths'. The latter were all 'found' prior to Smith Woodward's visits to the site and prior to his initial reconstruction of the hominid chimera... The canine tooth also needs to be considered. Not only was this made by a very different and far cruder process than the other fakes, but it was also the only 'hominid' piece not found by Dawson or Woodward...' The writer goes on to suggest that Teilhard or someone known to him had most likely introduced the canine. He is not convinced by the case against Hinton.)

Munizaga, J. R. 1993. More on Piltdown: the Keith–Shattock discrepancy reconsidered. *Current Anthropology*, **34**, 279–281. (The case made against Arthur Keith by Tobias maintains that Keith had mis-represented the findings of the pathologist Shattock (1914) in reporting that the exceptional thickness of the Piltdown skull was not pathological. Tobias also claims that, prior to the work of Shattock, little was known about the causes of exaggerated thickness of bones. The present writer points out that other writers at this time had already alluded to racial variations in skull thickness, and that Keith may have been aware of these findings. Before 1914 there seems to have been a consensus that thick cranial bones were only exceptionally attributable to pathology, but later this view was reversed, and some maintained that thick crania were always pathological. See Tobias 1992c, 255–256, 287–288.)

Murphy, T. 1959. Gradients of dentine exposure in human molar tooth attrition. *American Journal of Physical Anthropology*, **17** (3), 179–186. (Examines the dental wear exhibited in the teeth of Australian aboriginal skulls and discusses this in the context of the methodologies applied by Le Gros Clark 1955 and Marston in their separate studies of the Piltdown teeth. Not seen in full.)

Murray, T. 1994. Essay review [remarks on Spencer 1990]. *British Journal for the History of Science*, **27**, 103–104. (Cited in Turrittin 2006, who further notes (p. 22) that Tim Murray was a colleague of Ian Langham and one of several people who ensured that Langham's research on Piltdown was passed to Frank Spencer)

Musty, J. 1996. Dawson reprieved? Piltdown and XRF. *Current Archaeology*, **13** (6), no. 150, 226.

Newton, E. T. 1895. On a human skull and limb-bones found in the Palaeolithic terrace-gravel at Galley Hill, Kent. *Quarterly Journal of the Geological Society of London*, **51** (3), 505–527 (with discuss), plate XVI. (Announces the discovery of a skull and some post-cranial bones in the 100-foot terrace of the Thames, near Northfleet, Kent. In the discussion that followed the reading of this paper J. Allen Brown described the find as 'the best authenticated record of the occurrence of human remains in the higher river-drift that had yet been brought forward in England.' On the other hand, neither Sir John Evans nor Prof Boyd Dawkins were convinced that the skeleton was of the same age as the Palaeolithic gravels in which it lay, considering it to be a later interment. The latter view largely prevailed until taken up by Keith 1911b. In more recent times the Galley Hill skeleton has been shown to be an intrusive burial probably of post-Pleistocene date: see Oakley & Montague 1949, Oakley 1980a.)

Newton, E. T. 1897. The evidence for the existence of man in the Tertiary period. *Proceedings of the Geologists' Association*, **15** (2), 63–82. ('Much evidence has been brought forward which, if correct, would prove that man was present, not only in the Pliocene, or latest Tertiary, but also in the somewhat earlier times of the Miocene.' Of special interest in this respect is the discovery of *Pithecanthropus*, which the writer, along

with many other anthropologists and anatomists, had the opportunity of examining at first hand when it was exhibited at the Anthropological Institute in Nov 1895. 'It may be mentioned here that these bones are heavy, highly mineralized, and of a dark brown colour, similar to those of other animals found in the same deposit; so that there is no reason for questioning their being of the same age.' See Dubois 1894, 1896.)

Newton, E. T. 1899. Palæolithic man. *Proceedings of the Geologists' Association*, **15** (7), 246–263. (A review of some 29 interesting finds of Pleistocene man that have been made since the year 1700)

Newton, E. T. 1912 (contribution to discussion in Dawson & Woodward 1912: Newton made only one comment in respect of the Piltdown remains, where he 'called attention to the highly-mineralized condition of the specimens, which seemed to point to their being of Pliocene rather than of Pleistocene age.' In this respect, see Newton 1897.)

Nicholl, P. (see Anon. 1955a)

Nickell, J. & Fischer, J. F. 1992. *Mysterious realms: probing paranormal, historical, and forensic enigmas*. Amherst, NY: Prometheus Books, 221 pp. (Chapter devoted to 'The Piltdown perpetrator'. Not seen)

Nickells, M. K. 1992 (contribution to discussion in Tobias 1992c: the writer is not convinced that the motives attributed to Keith for carrying out the fraud are supported by the evidence. He points out that 'if the forgery was intended to enhance his professional stature, then it makes no sense to me at all that he decided that Smith Woodward should be the scientist whom Dawson would contact at the British Museum. For Keith to benefit to the extent he presumably thought necessary to achieve his alleged goal [election to the Royal Society], Piltdown should really have been his own discovery or collaboration. It is strange indeed to attempt to further one's own career by taking at best a secondary role to that of a colleague (one not even specially well-liked?) who is virtually assured of gaining even more from the episode.')

Norman, D. B. 2010. A taxonomy of iguanodontians (Dinosauria: Ornithopoda) from the lower Wealden Group (Cretaceous: Valanginian) of southern England. *Zootaxa*, no. 2489, 47–66. (Includes a reassessment of some iguanodontians collected by Charles Dawson. *Iguanodon dawsoni* is reclassified into a new genus, *Barilium*, and *Iguanodon fittoni* is reclassified into a new genus, *Hypselospinus*.)

Norman, D. B. 2011. On the osteology of the lower Wealden (Valanginian) ornithopod *Barilium dawsoni* (Iguanodontia: Styracosterna). *Special Papers in Palaeontology*, **86**, 165–194.

North, J. 1981. *Mask of the jaguar*. New York: Coward, McCann & Geoghegan, 276 pp. (First published as one of three separately authored novels in one volume, in 1980. The story is centred around a priceless Mayan jaguar mask of jade, bone and gold. Two characters are discussing a fraudulent archaeological find. Ruska reminds Julia of a parallel case, a 'remarkable discovery' in England that 'fooled experts for years until new scientific tests unmasked the fraud.' The oddest thing about this Piltdown fakery was 'the little man who must have perpetrated it—a respected, scholarly gentleman who had nothing—absolutely nothing!—to gain. The hoax brought him no money, no promotions, yet he spent months and maybe years perfecting his forgery. And at a terrible risk of disgrace! He wanted fame, to be sure, but also to make the world agree with a theory he believed in. He concocted Piltdown Man because he was sure that somewhere, unfound, a genuine Piltdown Man *had* to exist. In a warped mind, fraud in the service of truth seems hardly fraud at all.' Quote taken from Blinderman 1986, 101–2, who thinks 'this is one of the best comments made on the hoaxer...' It might also be the source of comments made in an anti-evolution work by Rutherford 2000, who would doubtless have consulted Blinderman's book.)

Nuttall, E. T. 1917. The Piltdown skull. *Man*, **17** (May), 80–82. (The writer, a medical man and a student of anthropology, believes that both Smith Woodward and Arthur Keith have erred in their respective reconstructions of the Piltdown cranium, noting that 'it is remarkable, and probably not without significance, that the errors in the earlier estimates of these two eminent scientists vary in consonance with their respective views regarding the period of man's origin.' He believes that several of the cranial bones have been wrongly placed by Woodward.)

Nuttall, N. 1990. Missing link found in Piltdown fraud. *The Times*, 6 June, 9. ('A former president of the Royal College of Surgeons, obsessed with becoming England's most eminent anthropologist, is being accused of perpetrating the greatest fraud of the century.' This article was among the first to break the news of Frank Spencer's case against Arthur Keith in his forthcoming book (Spencer 1990a). The story had also featured in the *New York Times* the day before (Wilford 1990). Dr Robin Cocks, head of palaeontology at the Natural History Museum, said "Many people for many years have claimed that Dawson was duped and the research by Frank Spencer concludes that it was actually Keith who was behind the whole thing." The suggestion put

forward by Cocks in this article, that the fraud was driven by acrimony and competition between Keith and Woodward, hardly seems justified given that no such relations between the two existed prior to Piltdown.)

Oakley, K. P. 1948. Fluorine and the relative dating of bones. *Advancement of Science*, **4**, no. 16, 336–337. (Based on the work of the French mineralogist, A. Carnot, published in 1893, the author suggests that an investigation of the fluorine content of the Piltdown remains might determine whether the jaw, canine and skull are of the same relative age. A. T. Marston (1946) has suggested that the jaw and canine ‘may not be stratigraphically contemporary with the cranial fragments; that the former is simian and from undisturbed basal gravel, and that the latter belong to *Homo sapiens* and came from an overlying layer of disturbed gravel of Upper Pleistocene age. Geologists and palaeontologists equally conversant with the evidence do not accept this interpretation of the finds; but Mr. Marston has made a stimulating challenge which might be put to the test by application of the fluorine technique.’)

Oakley, K. P. 1949. *Man the tool-maker*. London: Trustees of the British Museum, 98 pp. (Considers it doubtful that the ‘bone implement’ from Piltdown was ever associated with *Eoanthropus*, and suggests it may have been carved, perhaps with a metal blade, in late prehistoric or more recent times, pp. 69–71.)

Oakley, K. P. 1950a. Hominidae in relation to the Pliocene-Pleistocene boundary. In: *International Geological Congress: report of the eighteenth session, Great Britain, 1948. Part IX. The Pliocene-Pleistocene boundary* / edited by K. P. Oakley. London, p. 73, abstract. (‘...The occurrence of pre-Abbevillian pebble-tools in association with mammalian faunas of Villafranchian equivalence, in the Kageran beds at Kanam (Kenya) and Kikagati (Uganda), suggests that *Homo* (s.l.) may qualify for inclusion with *Elephas*, *Bos* and *Equus* as among the theoretical markers of the Pliocene-Pleistocene boundary.’ See also Baden-Powell 1950, and King & Oakley 1950, for other statements respecting the formal redefinition of the base of the Pleistocene, which in 1948 came to incorporate part of what had previously been regarded as Pliocene.)

Oakley, K. P. 1950b. Relative dating of the Piltdown skull. *Advancement of Science*, **4**, no. 24, 343–344. (Substance of a paper read to the Section of Anthropology and Archaeology, at Newcastle, 5 Sept 1949. The results of the fluorine test applied to the *Eoanthropus* material (Piltdown I & II) increases the probability that the skull and jaw from Barkham Manor represent a single creature (subsequent tests would prove otherwise), but the very low levels of fluorine indicate that Piltdown Man is considerably younger in geological age than previously thought.)

Oakley, K. P. 1950c. An account of the “fluorine test” for determining the relative antiquity of fossil bones. *Abstracts of the Proceedings of the Geological Society of London*, no. 1457 (13 Jan), 29–30. (Paper read at a meeting on 14 Dec 1949, describing the application of the fluorine test on the Galley Hill, Swanscombe and Piltdown remains. There then followed a presentation by A. T. Marston.)

Oakley, K. P. 1953. Piltdown. In: Catalogue des homes fossiles. Fascicule V. *Congrès Géologique International: Comptes rendus de la dix-neuvième session, Alger 1952. Section V. Les préhominiens et les hommes fossiles*, pp. 205–207. (A more detailed inventory of the whole Piltdown assemblage has been issued informally, though not yet published, by Robert Kruszyński 2012)

Oakley, K. P. 1954a. Chemical evidence of the modernity of the Piltdown mandible and canine. *Proceedings of the Geological Society of London*, no. 1504 (6 Jan), xv–xvi. (Report of presentation made at a meeting on 25 Nov 1953. Presentations were also made by A. T. Marston and J. S. Weiner; see Weiner 1954a)

Oakley, K. P. 1954b. [Piltdown and artificial staining of flints.] *Proceedings of the Geological Society of London*, no. 1508 (31 Mar), xlv–xlvii. (Report of a presentation made 24 Feb 1954, at which Oakley exhibited specimens to illustrate the probable artificiality of the staining of some of the flints recorded as implements from the Piltdown gravel. The so-called ‘eoliths’ showed no evidence of artificial staining. Marston 1954a made an extraordinarily blinkered presentation at this meeting.)

Oakley, K. P. 1954c. [New evidence on the fraudulent nature of the Piltdown assemblage.] *Proceedings of the Geological Society of London*, no. 1514 (15 Sept), cxx–cxxi. (Report of a presentation made at a meeting on 2 June 1954 demonstrating the results of new investigative techniques applied to the Piltdown assemblage. See Beer 1954)

Oakley, K. P. 1954d. Solving the Piltdown problem. Part I. *Archaeological News Letter*, **5** (6) Oct/Nov, 100–101.

Oakley, K. P. 1954e. Solving the Piltdown problem. Part II. *Archaeological News Letter*, **5** (7) Dec, 121–125. (See Oakley 1955d for final part in this series)

Oakley, K. P. 1955a. The Piltdown “implements.” In: Further contributions to the solution of the Piltdown problem / J. S. Weiner *et al.* *Bulletin of the British Museum (Natural History), Geology*, **2** (6), 243–246, plates 28–29. (The so-called flint ‘palaeoliths’, together with the Harry Morris flint core, were found to have been stained artificially. In all cases an iron-based stain was applied, but flint E.606 (found by Teilhard de Chardin) included the addition of chromium. The flints can be matched in form with the flint waste found in flint-mining or chipping sites of Neolithic or later age on the Chalk Downs of Sussex. The brown patina of the ‘eoliths’ was found to be entirely natural. ‘Whether in fact any artifacts occur in the Piltdown gravel is now doubtful.’ A broken nodule of black flint with heavily bruised edges, found by Woodward in 1916, was thought to be a hammerstone, but ‘bears more resemblance to a broken paving cobble bruised by cart-wheels.’ The bone ‘implement’ is a piece of the femur of a fossil elephant which has been whittled with a steel knife and the newly cut surfaces stained with an iron solution. The small fragments of bone, placed in the basal clay in order to make it appear that the ‘implement’ belonged to that level, are from the same source.)

Oakley, K. P. 1955b. The Piltdown Mammalia. In: Further contributions to the solution of the Piltdown problem / J. S. Weiner *et al.* *Bulletin of the British Museum (Natural History), Geology*, **2** (6), 247–253, plate 30, fig. 13. (‘Of the eighteen specimens of fossil mammals recorded from the Piltdown gravel by Dawson and Woodward, ten are unquestionably frauds, and there are strong grounds for believing that this is also true of the remainder. Since the gravel is decalcified (pH 6.5) it is probably unfossiliferous.’)

Oakley, K. P. 1955c. The composition of the Piltdown hominoid remains. In: Further contributions to the solution of the Piltdown problem / J. S. Weiner *et al.* *Bulletin of the British Museum (Natural History), Geology*, **2** (6), 254–265, plate 30, fig. 11. (The mandible, canine tooth and isolated molar are shown to be essentially modern, whereas the cranial fragments are older, ‘probably prehistoric’, although subsequent carbon dating would indicate an early medieval date (Spencer and Stringer 1989). All the Piltdown hominid fragments had been treated and stained, but the Piltdown II bones had received more intensive treatment with an acidic iron salt than any of the Piltdown I bones. The frontal bone of Piltdown II appears to belong with the Piltdown I skull, whereas the Piltdown II occipital is from a different skull. The human cranial fragments (frontal, parietal and zygomatica) reported to have been found by Dawson in gravel of the Piltdown terrace at Barcombe Mills appear to be pieces of two or possibly three skulls. All these fragments have been artificially iron-stained.)

Oakley, K. P. 1955d. Solving the Piltdown problem. Part III. *Archaeological News Letter*, **5** (9) Feb, 163–169.

Oakley, K. P. 1955e. Analytical methods of dating bones. *Advancement of Science*, **12**, no. 45 (June), 3–8. (Including a review of the application of the fluorine-dating technique to the Piltdown assemblage)

Oakley, K. P. 1957. Tools makyth man. *Antiquity*, **31** (Dec), no. 124, 199–209. (Including the subject of eoliths)

Oakley, K. P. 1960. Artificial thickening of bone and the Piltdown skull. *Nature*, **187** (9 July), 174. (A reply to Ashley Montagu, *ibid.* See under Montagu 1960b for explanation)

Oakley, K. P. 1963. Fluorine, uranium, and nitrogen dating of bone. In: *The scientist and archaeology* / edited by E. Pyddoke. London: Phoenix House, pp. 111–119, plates XA–XIIB. (Illustrated by the example of Piltdown. Plate XA: Mr L. E. Parsons drilling samples from one of the Piltdown skull bones, ready for fluorine analysis in 1949; Plate XB: Mr C. F. Fryd with the apparatus which he used in determining the fluorine content of the Piltdown bones in 1953; Plate XIIB: Photograph and autoradiograph of a cross-section of a fragment of one of the ‘Piltdown’ elephant teeth; Plate XIIA: Mrs A. Foster using a modified form of the micro-Kjeldahl method to determine the nitrogen content of the Piltdown bones; Plate XIIB: Electron micrograph of decalcified residue of sample of Piltdown jawbone showing banded collagen fibres.)

Oakley, K. P. 1963. Analytical methods of dating bones. In: *Science in archaeology: a comprehensive survey of progress and research* / edited by D. Brothwell & E. Higgs. London: Thames & Hudson, pp. 24–34, plates I–II. (Dating of the Piltdown finds, pp. 28–31)

Oakley, K. P. 1964. The problem of man’s antiquity: an historical survey. *Bulletin of the British Museum (Natural History), Geology*, **9** (5), 85–155, plates 1–3. (I. Antiquity of man: historical background; II. Periods and eras; III. Early attempts at dating: Aurignac, Neanderthal and Moulin-Quignon; IV. Miocene apes and spurious “Pliocene men” (e.g. Foxhall near Ipswich, and the Calaveras Skull, California); V. Cro-Magnon and other fossil men: the Palaeolithic sequence; VI. Dating the earliest men: Java and Heidelberg; VII. Principles of relative and absolute dating. In discussing the finds from Java and Heidelberg the writer notes that from remarks made by Arthur Keith in 1911, ‘the Pliocene ancestor of man was expected to have a more

ape-like lower jaw than the early Pleistocene Man of Heidelberg. At about the same time that Keith was expressing this opinion, another anatomist, Elliot Smith, had made out a strong case for believing that in the evolution of man “the brain led the way”. It was therefore not unreasonable to believe that the hypothetical ape-jawed ancestor living in the Pliocene period would have had a braincase that was manifestly human... It is not unlikely that against this background of ideas, the amateur archaeologist Charles Dawson began to entertain the hope that some of the ancient gravels in his own county of Sussex would one day yield relics of man’s Pliocene ancestor...’ In the discussion on methods of dating, Oakley lists the several recorded datings of the Piltdown cranium to illustrate some of the difficulties encountered, p. 149. The paper includes a useful and detailed index.)

Oakley, K. P. 1966. Introduction. In: *The human skull: a cultural history* / by F. Henschen. London: Thames and Hudson, 168 pp, 76 plates. (Cited in Tobias 1992c)

Oakley, K. P. 1968. The Piltdown skull. *New Scientist*, **40** (17 Oct), 154. (Points out that Dennis Rosen 1968 has not made a sufficiently clear distinction between the cranium and the lower jaw or mandible of the Piltdown ‘skull’. He notes that ‘Whereas the ape jaw had only been superficially stained, the human cranium which at first we saw no reason to doubt as “fossilized”, proved to be part of a comparatively modern skull, which had been severely treated chemically in order to appear fossilized.’)

Oakley, K. P. 1969. *Frameworks for dating fossil man*. 3rd ed. London: Weidenfeld & Nicolson, x, 366 pp.

Oakley, K. P. 1976. The Piltdown problem reconsidered. *Antiquity*, **50** (Mar), no. 197, 9–13. (Presents the known history of the affair. In regard to the possible source of orangutan jaw he notes that the finely crackled condition of the Piltdown mandible corresponds very closely with some of the orangutan bones in the NHM collection that were brought back from Sarawak by A. H. Everett in 1875. He thinks the skull had probably been derived from some ancient burial ground.)

Oakley, K. P. 1978. The Piltdown hoax. *The Times*, 7 Nov, 15. (A response to the reported assertions of Prof Douglas (e.g. Parker 1978) implicating W. J. Sollas in the Piltdown forgery. The writer identifies a number of errors in Douglas’s statement, and in respect of Sollas’s use of potassium dichromate (used to stain some of the Piltdown bones) notes that ‘Sollas used the serial-section method of making models of fossil skulls and it may have been in connection with this that he needed potassium dichromate, which is known to be useful for hardening organic tissues.’ See response from Halstead 1978b)

Oakley, K. P. 1979a. Piltdown stains. *Nature*, **278** (22 Mar), 302. (Response to Halstead 1979 concerning W. J. Sollas’s use of potassium dichromate)

Oakley, K. P. 1979b. Suspicions about Piltdown man. *New Scientist*, **82** (21 June), 1014. (A response to Gould’s criticism of the Natural History Museum’s handling of the Piltdown material prior to the exposure of the fraud in 1953. Gould has suggested that if the original specimens had been more readily available for investigation by visiting scholars, the forged nature of the material would have been recognised sooner and without recourse to chemical analysis. Oakley provides evidence to the contrary. He notes that Marston, a professional dentist, had examined the original material but ‘did *not* notice any features which he regarded as unnatural. Yet Carleton S. Coon has told me that during a visit to the BM(NH), in January or February 1951, he examined the Piltdown molars and noticed striae (barely detectable ridges and furrows) on their grinding surfaces which he thought looked “suspicious”... I presume that he thought on this occasion that the full implications of what he saw were too unbelievable to utter in words to me without further reflection. If Coon had firmly drawn my attention to the markings which he suspected were artificial, I am sure the cat would have been out of the bag on that day or soon after!’ Citing the view of Koestler 1949 that ‘jokes and scientific discoveries often have very similar origins: two different lines of reasoning (or evidence) converge to meet at a flash-point.’ Oakley goes on to suggest that ‘This is what really happened over Piltdown. Before November 1953 the anatomical evidence (eg wear of teeth) suggested to at least two scientists that the Piltdown skull might be bogus, but it was only when this line of evidence was fully explored, in consort with a study of the chemical composition of the specimens, that forgery was proved beyond doubt.’ He notes that ‘the first scientist to be sure in his own mind that the Piltdown skull (the cranium plus mandible) had been forged was a man who *never examined the original specimens*. I am referring to Gerrit S. Miller...’)

Oakley, K. P. 1980a. Relative dating of the fossil hominids of Europe. *Bulletin of the British Museum (Natural History), Geology*, **34** (1) 26 June, 1–63. (Including Galley Hill, Kent, p. 17; Gough’s Cave, ‘Cheddar Man’, Somerset, pp. 17–18, 29; Lloyd’s site, City of London, pp. 20, 21; Piltdown, pp. 9, 12–13, 22–24, 25, 52–53; Swanscombe, pp. 26, 27; La Chapelle-aux-Saints, Corrèze, France, pp. 31, 36; Moulin-Quignon, Somme, pp. 33, 34; Mauer, Heidelberg, pp. 37, 38.)

Oakley, K. P. 1980b. The Piltdown forgery. *The Times*, 23 July, 15. (Response to Norman Hammond 1980, in which Oakley, after recounting the story of Teilhard's visit to the Piltdown II site [subsequently shown by Walsh 1996 to have been Piltdown III], strongly maintains 'that until *positive* support for Teilhard's involvement with the Piltdown forgery has been brought forward, he should be given the benefit of the doubt.')

Oakley, K. P. 1981. Piltdown man. *New Scientist*, **92** (12 Nov), 457–458. (There is no proved factual evidence to support the premise put forward by Harrison Matthews that Teilhard de Chardin had any part to play in the Piltdown fraud. Oakley, who had himself considered Teilhard to be a prime suspect (e.g. Smoker 1997), now states that 'after spending a year thinking about this accusation, I have at last become convinced that it is erroneous.' This letter was published posthumously, Oakley having died on 2 Nov.)

Oakley, K. P. & Groves, P. 1970. Piltdown man: the realization of fraudulence. *Science*, **169** (21 Aug), 789. (Colin Groves was told by Theodore McKown in 1966 that Gerrit Miller of the American Museum of Natural History 'had confided to him his suspicion that things were not quite right about Piltdown, but had been persuaded by his colleagues not to publish his suspicion on the grounds that without positive proof this would be too serious an allegation of scientific fraud.' It seems that by 1930 Miller was definitely sure that some of the bones were the result of fraudulent alteration. In that year he asked Remington Kellogg, of the U.S. National Museum, to seek an opportunity during a visit to Europe to examine the Piltdown teeth at the Natural History Museum, 'because he had come to the conclusion that their shape had been artificially modified.' Unfortunately Kellogg did not find an opportunity to inspect the teeth.)

Oakley, K. P. & Hoskins, C. R. 1950. New evidence on the antiquity of Piltdown man. *Nature*, **165** (11 Mar), 379–382. (Formal presentation of the evidence recorded under Oakley 1950b)

Oakley, K. P. & Montague, M. F. A. 1949. A re-consideration of the Galley Hill skeleton. *Bulletin of the British Museum (Natural History), Geology*, **1** (2), 27–46, plate 4. (The Galley Hill skeleton was found in 1888 in the Swanscombe terrace gravels, which contain Acheulian hand-axes, and was described by Newton in 1895. Although there was controversy as to whether the skeleton was found in-situ or represented a later interment, Arthur Keith and others came to regard it as an indication that *Homo sapiens* already existed in 'modern' form by Middle Pleistocene times. Comparison of its fluorine content with that of fossil mammals of the Swanscombe gravels indicates that it is an intrusive burial probably of post-Pleistocene date.)

Oakley, K. P. & Weiner, J. S. 1953. Chemical examination of the Piltdown implements. *Nature*, **172** (12 Dec), 1110. (Reports the findings of E. T. Hall, Clarendon Laboratory, Oxford, on the composition of the surface stains on the Piltdown flint 'implements')

Oakley, K. P. & Weiner, J. S. 1955. Piltdown Man. *American Scientist*, **43** (4), 573–583. (A review of the investigations that led to the exposure of the fraud)

Oakley, K. P. (see also: Anon. 1954c, 1978, Chatwin, Daniel 1982a, De Vries & Oakley 1959, Eastwood & Oakley 1953, Farrar 1979b, Miles 2003, Millar 1972, Moore 1955, Smoker 1997, Weiner *et al.*; Turrittin 2006 lists other Piltdown-related contributions by Oakley. For an obituary see Anon. 1981)

Obermaier, H. 1916. *El hombre fósil*. Madrid: Museo Nacional de Ciencias Naturales, 397 pp, 19 plates (*Memoria, Comisión de Investigaciones Paleontológicas y Prehistóricas*, no. 9); 2nd ed. 1925, Madrid: Museo Nacional de Ciencias Naturales, 457 pp, 26 plates. (*Eoanthropus*, pp. 321–323, 342–344. Hugo Obermaier taught at the Institut de Paléontologie Humaine in Paris, along with Marcellin Boule, when Teilhard de Chardin was a student there. Like Boule and Teilhard, he could see no harmony between the Piltdown jaw and cranium.)

Oke, A. W. 1926. [Letter throwing doubt on the reported circumstances of the finding of the Piltdown fragments]. Unnamed Brighton newspaper, dated 30 Dec, cited in Weiner 1955b, 164. (See Weiner's notes and discussion in Spencer 1990b, 245–6. Alfred William Oke, 1860–1944 was a solicitor living at Hove, a Fellow of the Geological Society and a member of the Sussex Archaeological Society. As reported by Weiner 1955b, Oke stated in his account that 'I was present at the meeting of the Geological Society when Mr. Dawson produced a bone implement from Piltdown, which, he said, was found in the soil from the pits, but he had to leave to catch his train before he could be cross-examined.' Another assertion was that 'The fragments of bone are only held together by the story of the workman bringing to the late Mr. C. Dawson only a fragment of what he and his mates thought to be a coconut. Mr. C. Dawson was a Coroner, and, therefore, understood the laws of evidence, but no Sussex jury would have been satisfied that the cleverly reconstructed skull consisted of bones belonging to the same being.' Farrant (2013, 186 n. 147) has been unable to find Oke's letter in any Brighton newspapers of the date indicated.)

Opie, J. 1993. "Piltdown," a "fairy-sighting," and fake Vermeer paintings. *Oriental Rug Review*, **13** (2). (Not seen)

Oppenheim, S. 1913. Das Gehirn des Homo Neandertalensis sive primigenius. *Naturwissenschaften*, **1**, 955–958. (Comparison with Piltdown, p. 958. Cited in Quenstedt 1936)

Osborn, H. F. 1915a. Review of the Pleistocene of Europe, Asia and northern Africa. *Annals of the New York Academy of Sciences*, **26**, 215–315. (*Eoanthropus*, pp. 286–287. Cited in Quenstedt 1936.)

Osborn, H. F. 1915b. *Men of the Old Stone Age: their environment, life and art*. New York: Charles Scribner's Sons, xxvi, 545 pp., 8 plates. (Preface dated 21 June 1915. In discussing Piltdown man, the author disagrees with Smith Woodward's early Pleistocene date, preferring instead a late Pleistocene date. He also places the canine in the upper, rather than the lower jaw. Piltdown references for this edition (not seen) are as given below for the 2nd edition, apart from the 'additional note' mentioned therein.)

Osborn, H. F. 1916. *Men of the Old Stone Age: their environment, life and art*. 2nd ed. New York: Charles Scribner's Sons; London: G. Bell and Sons, xxvi, 545 pp., 8 plates. (Preface to 2nd ed. dated 20 Dec 1915. The Piltdown race, pp. 130–144, plate IV: a restoration of the Piltdown head modelled by J. H. McGregor, 1914; additional note on Piltdown jaw and its likeness to chimpanzee, p. 512, based on the paper by G. S. Miller 1915; other incidental references, pp. viii–ix, xi–xii, 127–128, 489–492. Reviewed by Smith, G. E. 1916b, Johnston 1916, Keith 1917.)

Osborn, H. F. 1918. *Men of the Old Stone Age: their environment, life and art*. 3rd ed. New York: Charles Scribner's Sons; London: G. Bell and Sons, xxviii, 559 pp., 8 plates. (Preface to 3rd ed. dated 1 May 1918. The Piltdown race, pp. 130–144, plate IV; The skull and jaw of the Piltdown man, pp. 512–513; the writer considers that 'it is not finally agreed that the Piltdown jaw belongs with the Piltdown skull, because the new evidence brought forward by Dr. Smith Woodward, although strong, is not deemed entirely conclusive', p. xiv)

Osborn, H. F. 1920. The hall of the Age of Man in the American Museum. *Natural History*, **20** (3) May–June, 228–246; subsequently issued as Guide leaflet no. 52, American Museum of Natural History, 1921, with slight changes, 20 pp; Quenstedt 1936 cites 2nd ed. 1923, 38 pp. (Piltdown man, p. 9, & figs 1–3 on pp. 5 & 6); there was a 5th edition, revised and enlarged, in 1929, 52 pp. (1920 paper: 'The cradle of the human race was, in our opinion, in Asia, in regions not yet explored by palaeontologists... Only two races, the Heidelberg and the Piltdown, are certainly known from the river drifts and gravels before the period of burials... The museum series began in 1915 with the gift of the J. Leon Williams Collection... The problem whether the Piltdown jaw belongs to [the] human skull or whether it belongs to a fossil chimpanzee is still not actually settled.' Includes a photograph of Case II in the hall of the Age of Man 'showing the Heidelberg and the Piltdown man of the early part of the Old Stone age in Europe, from before 100,000 B.C. to about 45,000 B.C.')

Osborn, H. F. 1922a. The Pliocene man of Foxhall in East Anglia. *Natural History*, **21** (6) for Nov–Dec 1921, 564–576. (The author visited England in the summer of 1921 in order to examine supposed pre-Palaeolithic sites at Foxhall, near Ipswich, and Piltdown. At Foxhall Quarry, J. Reid Moir had identified what he believed to be an occupation level containing primitive flint implements within the Upper Pliocene Red Crag, examples of which are here illustrated. He notes that Reid Moir has compared the flints with those from Piltdown, a subject discussed further in Osborn 1922b. A frontispiece (p. 564) presents portraits of J. Reid Moir and E. Ray Lankester, two staunch proponents of man's origin in the Pliocene epoch.)

Osborn, H. F. 1922b. The Dawn Man of Piltdown, Sussex. *Natural History*, **21** (6) for Nov/Dec 1921, 577–590. (Recounts the author's conversion from disbeliever to zealous supporter of *Eoanthropus* following a close examination in July 1921 of the Piltdown finds at the Natural History Museum, and a visit to Barkham Manor made in the company of Smith Woodward and Dr. H. M. Ami. The paper includes a sketch section by the author (Fig. 8) which attempts to show the relative location of the principal finds, and an excellent photograph (Fig. 9) of Woodward, Dawson and Venus Hargreaves sifting gravel in '1912' (actually 1913), taken from a film made under the direction of J. Leon Williams. Fig. 15D shows Smith Woodward and the author 'standing on the heap of Piltdown gravel immediately above the spot where the skull was found', noting that 'At this point it is proposed to erect a monument in memory of Piltdown Man. (The geological hammer held by Woodward in this photograph is now in the possession of the British Geological Survey, object 2008.31). Osborn notes that W. K. Gregory, M. Hellman and himself 'all see a close resemblance between the Piltdown canine and the right lower canine of a female gorilla of relatively small size (p. 586, footnote). With regard to Reid Moir's evidence for Pliocene man at Foxhall Quarry, near Ipswich, he notes the resemblance between the primitive Red Crag 'implements' from Foxhall and the so-called palaeoliths from Piltdown, but favours an early Pleistocene date for the latter; see Osborn 1922a, figure on p. 566.)

- Osborn, H. F.** 1927a. *Man rises to Parnassus: critical epochs in the prehistory of man*. Princeton, NJ: Princeton University Press, xix, 217 pp, 34 plates. (*Eoanthropus*, the Dawn Man of Piltdown, pp. 51–72; the text is taken from Osborn 1922b)
- Osborn, H. F.** 1927b. Recent discoveries relating to the origin and antiquity of man. *Science*, **65**, 481–488 (*Eoanthropus*, p. 484. Cited in Quenstedt 1936.)
- Osborn, H. F.** 1927c. Recent discoveries relating to the origin and antiquity of man. *Proceedings of the American Philosophical Society*, **66**, 373–389. (*Eoanthropus*, pp. 380, 388. Cited in Quenstedt 1936.)
- Osborn, H. F.** 1929. Is the Ape-Man a myth? *Human Biology*, **1** (1), 4–9.
- Osborn, H. F.** 1929. Note on the geologic age of *Pithecanthropus* and *Eoanthropus*. *Science*, **69**, 216–217. (Cited in Quenstedt 1936)
- Osborn, H. F.** 1930. The discovery of Tertiary man. *Nature*, **125** (11 Jan), 53–57. ('As Quaternary fossil man was the central biological contribution of the nineteenth century, so Tertiary man constitutes the goal and peak of biological discovery in the twentieth century... before a meeting of the National Academy of Sciences [c.1919] I predicted that the greatest surprise in store for twentieth-century science would be the discovery of a large-brained Tertiary man! This anatomical prophecy has unexpectedly been confirmed by recent palæontological evidence that *Eoanthropus*, the 'dawn-man' of Sussex, is of Upper Pliocene or Tertiary age.' An article with the same title appeared the same year in *Science*, **71**, 1–7.)
- Osborn, H. F.** 1932. The geologic age of *Pithecanthropus*, *Eoanthropus*, and other fossil men determined by the enamel-ridge-plate-grinding-tooth-measurement of the Proboscidea with which they were geologically contemporaneous. *Report, British Association for the Advancement of Science*, London, 1931, 451–453. (Examines the bearing which the association of fossil remains of man with those of primitive elephants or mastodons has upon the question of the geological antiquity of man. On this basis he finds *Eoanthropus dawsoni* to be the earliest representative of man, dating from Upper Pliocene or Lower Pleistocene age. See Osborn 1942 for a more complete discussion.)
- Osborn, H. F.** 1936. L'âge géologique de l'homme de Piltdown (*Eoanthropus*) et de l'homme de Trinil (*Pithecanthropus*). In: *Mélanges de préhistoire et d'anthropologie offerts au Professor Henri Bégouen à l'occasion de son 70^e Anniversaire (20 Novembre, 1863–1933) par ses Élèves, ses Collègues et ses Amis*, pp. 23–36. (Not seen)
- Osborn, H. F.** 1942. *Proboscidea: a monograph of the discovery, evolution, migration and extinction of the mastodons and elephants of the world. Volume II. Stegodontoidea, Elephantoidea*. New York: American Museum Press. (Including a detailed description of *Archidiskodon planifrons* from the Piltdown gravel, pp. 964–968; originally identified by Smith Woodward as *Stegodon*, and subsequently referred by Freudenberg 1915 to *Elephas*. Osborn considers *Eoanthropus dawsoni* to be contemporary with *Archidiskodon* and thus of Upper Pliocene age. A letter from A. T. Hopwood, dated 4 June 1928, likewise expresses an inclination to put the Piltdown skull 'with the older fauna, and the Eolithic culture.' Page 968, fig. 856, presents a 'Scene on the ancient River Ouse illustrating the Osborn theory of the Upper Pliocene age of *Eoanthropus dawsoni* / Restoration by Margret Flinsch in 1934, under the direction of Henry Fairfield Osborn.' This scene depicts Piltdown Man wielding the bone 'implement', while on the left bank of the river we see *Archidiskodon planifrons*, together with the straight-tusked mastodon, *Anancus arvernensis*, and on the right bank, a herd of *Equus stenonensis*.)
- Osborn, H. F. & Gregory, W. K.** 1923. The Dawn Man [: an authorised interview.] *McClure's Magazine*, **55** (1), 19–28. (Not seen)
- Padgham, D.** 2004. X-filed fossils. *British Archaeology*, no. 75 (Mar), 34. (A response to the article by Pitts 2004, which included edited extracts from a series of articles about the activities of Charles Dawson, written by the unidentified C.F.E.B. The correspondent, of St Leonards-on-Sea, suggests that 'CFEB was C F Baxter of Lewes, member of the Sussex Archaeological Society and probable partner of local solicitors Wynne Baxter & Son, whose founder was a contemporary of Dawson.' No explanation is given for the third initial. See also suggestion of Russell 2004.)
- Padgham, F.** (see Anon. 1954a)
- Paine, C.** 2013. Mystery of the two martyrs: where are the firebacks now? *Sussex Past & Present*, no. 130 (Aug), 6–7. (The Sussex Archaeological Society possesses a cast-iron fireback known as 'The Sussex Martyrs

fireback', on the back of which is inscribed 'Sussex Martyrs / Burwash / cast August 1908 / Charles Dawson FSA'. It is said to be one of three replicas made to the order of Henry Willett, who died Feb 1905 (not 1903 as here stated). Nothing is known regarding the present whereabouts either of the other two copies or the original. One copy appears to have been in the possession of Hastings Museum, though only in the form of a plaster cast, and is now lost. A fireback like this was recorded at Brick House, Burwash in 1871, and the replicas may have been made at the Burwash forge. A rather poor photograph of the fireback features in Dawson 1903, plate 8e, and is stated to be from Dawson's collection, but seems to differ slightly, possibly because of retouching, from the example illustrated in the present paper. We are thus presented with a mystery as to whether the inscribed date of 'August 1908', which has been confirmed by this Compiler, is an error on Dawson's part, or indicates a later casting! Crispin Paine's article prompted some correspondence from Jeremy Hodgkinson and Dr Paul Quinn, *Sussex Past & Present*, no. 131, Dec 2013, p. 8.)

Pallister, D. 1978. Professional pique and the Piltdown Man. *Guardian*, 30 Oct, 3. (A report, with some additional details, of Halstead's presentation of James Douglas's 'evidence' implicating W. J. Sollas as co-conspirator with Dawson in the Piltdown fraud. See also Holliday & Williams 1978, & Parker 1978.)

Parker, G. E. 1981. Origin of mankind. *Acts & Facts*, 10 (11), ICR website. (Dr Gary Parker, of the Institute for Creation Research, demonstrated creativity (or something else) when he came up with the oft-quoted myth that 'Over 500 doctoral dissertations were done on Piltdown, yet all of this intense scrutiny failed to expose the fake.' This figure most likely came from a report of a meeting at the Geological Society of London in July 1954 which made a detailed presentation of the evidence for fraud at Piltdown. The report appeared in *Nature* (Anon. 1954c) and included the statement that 'More than five hundred articles and memoirs are said to have been written about Piltdown man.' The figure might have been 'more than 300', since Oakley 1953 had stated in a footnote that 'Over 300 published references to *Eoanthropus* are listed in W. and A. Quenstedt, 1936.' The question is discussed further on the Richard Harter's World website, where Malcolm Muggeridge is given as a possible source for the figure, which features in his book *The end of Christendom*, p. 59, published in 1980.)

Parker, R. 1978. Professor names his predecessor as Piltdown Man hoaxer. *The Times*, 30 Oct, 2. (Report of J. Douglas's tape-recorded assertions against W. J. Sollas. Also reported by Pallister 1978, among others.)

Paul, G. 1983. Die Sache mit dem Piltdown-Menschen: eine neue These belebt die Diskussion um eine alte Fälschung. *Frankfurter Allgemeine Zeitung*, 11 Aug. (Discusses the accusation made against Conan Doyle by Winslow & Meyer 1983a)

Peacock, D. P. S. 1973. Forged brick-stamps from Pevensey. *Antiquity*, 47, no. 186, 138–140. (A detailed scientific examination of the brick-stamps supposedly dating from the time of the Roman emperor Honorius, AD 395–423 and stated by Dawson to have been discovered on the site of the Roman fort of Pevensey, shows them to be early 20th-century forgeries. See Dawson 1907b. Russell 2003, 97–107, devotes a whole chapter to the Pevensey bricks. See also Baines 1997, and Farrant 2013. The latter writer notes that Dawson lodged with a brick-moulder from 1890 to 1904, in a road with a brickfield, p. 171.)

Pelletier, F. (Father Félix Pelletier was a frequent companion of Teilhard de Chardin's during the latter's fossil-collecting excursions around the Hastings area. The two priests collected fossil mammals and plants, some of which were identified as new species. Pelletier had two new species of Wealden plant named after him, *Hausmannia pelletieri* and *Pelletieria valdenis* (Seward 1913). Millar 1998 suggested that Pelletier, who had a knowledge of chemistry which Teilhard lacked, assisted the latter in perpetrating the Piltdown forgery.)

Perrin, P. & Coleman, W. 2004. *The mystery of the Piltdown skull*. Logan, Iowa: Perfection Learning, 64 pp. (This work is evidently aimed at a young audience)

Pettitt, J. 1975. No absolution. *Sussex Archaeological Society Newsletter*, no. 15 (Mar), 67. (An analysis of the 'Maresfield Forge' map, which is credited to Dawson, has yielded 'the impossible, the 'never-was' and three major anachronisms.' A number of these discrepancies are described. The author claims to have a longer, referenced article with maps and grid references; he was possibly unaware of Andrews 1974.)

Philp, B. 2013. In the shadow of Charles Dawson. *Sussex Past & Present*, no. 130 (Aug), 16. (Since 1952 the writer, an archaeologist, has been excavating and publishing the Saxon Shore forts at Reculver and Dover. When the Piltdown forgery was exposed in 1953 he became suspicious of the stamped tile from Pevensey and accordingly warned the British Museum in 1960, but it was not until 1973 that this was also exposed (Peacock 1973). Over the past five years he has been excavating and surveying on the island of Madeira. When asked by fellow Portuguese archaeologists about the prospect of finding Captain Kidd's buried treasure on the

adjacent Salvagen Islands, he discovered that three(?) treasure maps relating to Kidd had been found progressively in Eastbourne in 1929, by a Mr H. Palmer. These highly fortuitous discoveries seem rather suspicious and the writer wonders if there might be a link between Dawson and Palmer, since both were solicitors, both lived in East Sussex, and both claimed to have made exceptional discoveries. Evidently several expeditions have risked lives in the China Seas area on the basis of these maps.)

Piette, É. & Pilloy, J. 1907. *L'art pendant l'âge du renne: album de cent planches*. Paris: Masson et Cie, 112 pp. (Cited by Dawson in Dawson & Woodward 1913a (122, fn 2), where Dawson, in reference to flint implements 'of the Chellean or pre-Chellean stage' from Piltdown, notes that 'The Piltdown specimens may be compared with an example from Chelles, figured in Piette... p. 36'.)

Pigliucci, M. 2005. Piltdown and how science really works. *Skeptical Inquirer*, **29** (1), 20–21. (Massimo Pigliucci is professor of philosophy at the City University of New York. See response by Shaw 2005)

Pilgrim, G. E. 1915. New Siwalik primates and their bearing on the question of the evolution of Man and the Anthropoidea. *Records of the Geological Survey of India*, **45** (1), 1–74, plates I–IV. (Concludes from comparative studies that '*Eoanthropus* represents a collateral stem which did not lead to Man as we know him from any of the recent and most of the fossil types, being, so to speak, only one of Nature's experiments at producing the higher human types.' See pp. 38, 51–52, 57–60.)

Pitts, M. 2004. Piltdown: time to stop the slurs. *British Archaeology*, no. 74 (Jan), 8–12. (Presents edited extracts from a series of articles by the unidentified C.F.E.B. which appeared in the *Sussex Express & County Herald*, Nov and Dec 1954 (see Anon. 1954e–h). The author of these perceptive and well informed articles had set out to reveal the character of Charles Dawson by interviewing people who had been associated with him. Apart from these extracts the *BA* article includes two additional items. By far the most significant is a colour reproduction of the card on which Harry Morris accuses Dawson of fraud, first identified by Weiner 1955. It now appears that some words in pencil beneath the ink writing, normally transcribed *Watch C. Dawson. Kind regards* (Weiner 1955, 158), actually reads *With M' C. Dawson's / kind regards*. The card thus proves that Dawson did indeed supply Morris with the fraudulent flint that accompanies it. The second item consists of brief extracts from a videotape recording of a talk given by Joseph Weiner in 1981 in which he defended Teilhard de Chardin against the accusations of Stephen J. Gould and was explicit in claiming Dawson as the sole culprit in the Piltdown fraud. A summary of Weiner's presentation is also to be found in King, T. M. 1983a. Regarding the identity of CFEB see the suggestions of Padgham, D. 2004 and Russell 2004, neither of which appears likely in view of the statement made in Anon. 1954e. There were also comments from Mullan 2004. See also Stringer 2004, which follows the paper by Mike Pitts.)

Place, M. 1994. *Piltdown man and bat woman*. Batley, Yorkshire: Spout Publications, 24 pp. (Poetry)

Pontier, G. 1925. Etude sur l'*Elephas planifrons* (Falconer) du Pliocène supérieur d'Angleterre. *Annales de la Société Géologique du Nord*, **48**, 153–159, plate II. (A discussion of the occurrence of *Elephas planifrons* in the Red Crag of Norfolk and Suffolk. The Piltdown find identified by Smith Woodward as *Stegodon*, but subsequently referred to *Elephas* cf. *planifrons* by Matsumoto 1918, is not noticed.)

Pope, M. 2012. Piltdown re-excavated. In: *Piltdown – 100 years on, Geological Society London, Burlington House, Piccadilly, 18th December 2012: abstract book* / compiled by R. T. J. Moody, pp. 22–23, including photos. (Poster abstract. Two test pits were excavated at the site of the original Piltdown discovery at Barkham Manor, one immediately adjacent to the monolith marking the Piltdown 1 find spot and another to the west in a field where further stone tools were found. The edge of the original pit was exposed and a record which entirely matches Dawson's observations was taken. This included overlying loams, the ferruginous gravels and the 'yellow clay' at the base of the sequence. The work has produced samples for dating, gravel class size analysis and pollen work and it is hoped in the course of time to produce an account of the gravels, which appear to be genuine Pleistocene sediment. The work was carried out by the Institute of Archaeology.)

Pope, M. 2013. Sussex can take no pride in Piltdown. *British Archaeology*, no. 128, 50–51. (An expanded account of the investigation described in Pope 2012. The excavation at Barkham Manor was undertaken in Nov 2012. Not reproduced in either of these papers are some humorous re-enactments by Pope's team, in which they attempted to replicate two contemporary photographs of the original Piltdown excavations featuring Dawson, Smith Woodward and the labourer, Venus Hargreaves.)

Postlethwaite, F. J. M. 1953. Piltdown Man. *The Times*, 25 Nov, 9. (Letter defending his step-father, Charles Dawson, from accusations of forgery. 'Charles Dawson was an unassuming and thoroughly honest man and very painstaking, as when he wrote *The History of Hastings Castle*, entailing years of research. From an early age he was interested in flint implements and fossils, uncovering the bones of some saurian near Hastings.

He exercised his great general knowledge in many ways, discovering natural gas at Heathfield and becoming an authority on Sussex iron. His hobbies extended in many directions, but it is doubtful whether he could be described as a great expert in any single subject... Charles Dawson was at all times far too honest and faithful to his research to have been accessory to any faking whatsoever.' For a joint reaction from other members of Dawson's family see Towler 1953.)

Preece, R. C. 1990. Alfred Santer Kennard (1970–1948): his contribution to malacology, Quaternary research and the Geologists' Association. *Proceedings of the Geologists' Association*, **101** (3), 239–258. ('Although Kennard believed in eoliths, he was always sceptical about the Piltdown discoveries. He not only questioned whether [the bone implement] could really have been cut when fresh (Discussion in Dawson & Woodward, 1915) but even doubted the authenticity of the Piltdown eoliths themselves (Kennard, 1947). According to Weiner (1955), Kennard let it be known on several occasions in the 1940's that he believed Piltdown man to be a hoax and that he knew the identity of the perpetrator. This knowledge undoubtedly results from his close association with the Ightham Circle, and several members of it have been implicated in the forgery.'))

Prosser, C. 2009. The Piltdown Skull Site: the rise and fall of Britain's first geological National Nature Reserve and its place in the history of nature conservation. *Proceedings of the Geologists' Association*, **120** (1), 79–88. (The Piltdown Skull Site at Barkham Manor was one of the first sites in Britain to be considered for acquisition and listing as a National Nature Reserve (NNR). In Sept 1950 a small 'witness section' was opened up close to the site of the original finds (Toombs 1952). To preserve the section for future scientific study it was bricked-in on two sides, save for a couple of small glass doors on either side of the trench. The site was acquired by the Nature Conservancy on 3 Dec 1951, and formally declared a NNR on 19 May 1952. It would subsequently earn notoriety as the first NNR to be revoked, on 7 Feb 1955. See Anon 1954d)

Prosser, C. 2012. The Piltdown Skull Site: the very short story of the UK's first geological National Nature Reserve. In: *Piltdown – 100 years on, Geological Society London, Burlington House, Piccadilly, 18th December 2012: abstract book* / compiled by R. T. J. Moody, pp. 18–19. (Poster abstract. Includes a photo showing the window in the 'witness section' at the Piltdown Skull Site in the early 1950s. 'The site and the memorial stone still remain today and although the fences and path have gone, the brick alley to what was the 'witness section' is still visible. The site is no longer an NNR of great scientific interest but it is still surely of importance to the history of science, geology, archaeology and nature conservation and as such is part of our national heritage. It is currently in private ownership with no obvious immediate threats but it has no heritage recognition or protection. The views of the delegates are sought as to whether the site of the Piltdown 'finds' should be recognised and managed as part of our national heritage and if so how this could be achieved?')

Pryce, E. (see Daniel 1986)

Puccioni, N. 1913. Appunti intorno al frammento mandibolare fossile di Piltdown (Sussex). *Archivio per l'Antropologia e la Etnologia* (Firenze), **43**, 167–175. (Argues against the Piltdown jaw and skull belonging to the same individual, and suggests that the jaw is more reminiscent of a Neanderthal than a chimpanzee, this latter assertion presumably being in response to the suggestion of Waterston 1913.)

Puccioni, N. 1914. Morphologie du maxillaire inférieur. *L'Anthropologie*, **25**, 291–321. (Piltdown jaw, p. 315, etc, in which he largely reaffirms his earlier view that the Piltdown jaw is less ape-like than Smith Woodward makes it appear.)

Puydt, M. de & Lohest, M. 1887. L'homme contemporain du mammoth à Spy, province de Namur (Belgique): crânes et ossement humains de la race de Neanderthal. *Annales de la Fédération archéologique et historique de Belgique*, **11**, 205–240, plates I–X.

Pycraft, W. P. 1912. The most ancient inhabitant of England: the newly-found Sussex man. *Illustrated London News*, **141** (28 Dec), 958, etc. (Pycraft, an osteologist at the Natural History Museum, was consulted by Smith Woodward on the restoration of the Piltdown remains. His article includes the first drawing of the restored jaw and a reconstruction in profile of the head of Piltdown man. In addition, an impressionistic reconstruction of the ancient 'Sussex man', shown hunting on the banks of the River Ouse, was supplied by the artist, A. Forestier. Woodward advised the artist on the reconstruction, which included hippos on the evidence of teeth found at Piltdown. Forestier's illustration is reproduced in Spencer 1990a, 52–53, and Thomas 2002, 27, the latter slightly cropped. See entries under Forestier, 1912, 1913)

Pycraft, W. P. 1913a. Ape-man or modern man? The two Piltdown skull reconstructions: the case for Dr. A. Smith Woodward's reconstruction. *Illustrated London News*, **143**, 23 Aug, 282. (Stoutly defends Smith Woodward's reconstruction of the Piltdown skull against the alternative restoration put forward by Arthur

Keith (1913e). In response to those who argue that the skull is human and the jaw ape, he conceitedly asserts that ‘no one competent to express an opinion would accept this interpretation.’)

Pycraft, W. P. 1913b. Ape-man or modern man? The two Piltdown skull reconstructions. *Illustrated London News*, **143**, 20 Sept, 444. (A typically bumptious diatribe from Pycraft’s poisoned pen, prompted by Smith Woodward’s announcement at a meeting of the British Association on 16 Sept (Woodward 1914a) of the discovery of the canine tooth, which vindicated his reconstruction of the Piltdown skull and jaw in the face of Keith’s objections. ‘According to Professor Arthur Keith, of the Royal College of Surgeons, *Eoanthropus* might have edited a newspaper. According to Dr. Smith Woodward, of the British Museum, he would have made a very poor “printer’s devil.” Who shall decide between them?’ Pycraft’s boastful claim that Woodward ‘has spent a lifetime in studying extinct animals’ conveniently overlooks the fact that these extinct ‘animals’ had mostly comprised fish! He concludes: ‘I should like to say that I have just essayed an independent restoration of the skull. Ignoring all other work, and simply “articulating the bones in a manner which has been accepted by all anatomists in all times,” as Professor Keith claims to have done, but without attempting to prove a theory, I found, when I came to compare my restoration with that of Dr. Smith Woodward, that it did not differ by one millimetre. The result is not surprising.’)

Pycraft, W. P. 1915. Mankind in the making. *Scientific American*, **62** (5) 20 Jan, 100–101. (Not seen)

Pycraft, W. P. 1916. (contribution to discussion in Lyne 1916, 58)

Pycraft, W. P. 1917a. The jaw of the Piltdown Man: a reply to Mr. Gerrit S. Miller. *Science Progress*, **11**, no. 43 (Jan), 389–409. (A stern and detailed response to Miller’s assertion (1915) that the Piltdown jaw and cranium do not belong together. He considers that Miller’s ‘unfortunate lack of the right perspective has caused him to overlook some of the most significant features of these remains, and has absolutely warped his judgement in regard to the relative values of the likenesses between these fragments and the skulls of the chimpanzee which he has so woefully misread.’ W. K. Gregory (correspondence in Spencer 1990b, 145–6) described Pycraft’s response as ‘impudent and bombastic’.)

Pycraft, W. P. 1917b (contribution to discussion in Woodward 1917b, in which he dismisses Miller’s attempt to compare the Piltdown jaw with that of an abnormal chimpanzee; see also Woodward 1918)

Pycraft, W. P., Smith, G. E., Yearsley, M., Carter, J. T., Smith, R. A., Hopwood, A. T., Bate, D. M. A. & Swinton, W. E. 1928. *Rhodesian Man and associated remains*. London: Trustees of the British Museum (Natural History), xiii, 75, [6] pp, 5 plates. (See Woodward 1921)

Pycraft, W. P. (for an obituary see Woodward 1942)

Quenstedt, W. & A. 1936. *Fossilium catalogus. I: Animalia. Pars 74: Hominidae fossiles*. Hague: W. Junk (?*Eoanthropus dawsoni* Woodward 1913: including list of synonyms; 317 author citations are indexed chronologically from 1912 to 1935, pp. 191–197; references in main bibliography, pp. 8–174. Indexed citations are also provided for the London or Lloyd’s Lady, p. 289; Foxhall, Ipswich, p. 292; Galley Hill, Kent, pp. 292–5; Ipswich I, p. 296; and others.)

Ramström, M. 1916. Om underkäken i Piltdown-fyndet (“*Eoanthropus*”). *Svenska Läkaresällskapets Handlingar*, **42** (3), 1223–1256 (Swedish with German summary).

Ramström, M. 1919. Der Piltdown-Fund. *Bulletin of the Geological Institution of the University of Upsala*, **16**, 261–304. (Argues, in agreement with G. S. Miller and D. Waterston, that the Piltdown jaw is more like that of a chimpanzee)

Ramström, M. 1921. Der Java-Trinil-Fund “*Pithecanthropus*” oder: Können die “*Eoanthropus*”- und “*Pithecanthropus*”- Funde uns zuverlässige Aufschlüsse über die Anthropogenese geben? *Uppsala Läkareförenings Förhandlingar*, N.F., **26**, 1–37. (*Eoanthropus*, pp. 3–6)

Ray, J. E. 1909. Skeletons found near Eastbourne. *Sussex Archaeological Collections*, **52**, 189–192. (Charles Dawson assisted in the examination of two excavated Neolithic skeletons in 1907. Not seen)

Raymond, E. 1969. *Please you, draw near: an autobiography, 1922–1968*. London: Cassell & Co, 179 pp. (This is the second of a two-volume autobiography by the British novelist, Ernest Raymond, which includes a chapter on Piltdown. Blinderman 1986, 86, has the following quote from the end of that chapter: ‘Who the scholarly forger was remains one of the world’s great mysteries, though, to my mind, deductions from possibility, probability, psychology, and horse sense point steadily to one figure. Before whom I bow.’)

Blinderman drily remarks that 'He does not shed light on whom possibility, probability, psychology, and horse sense point to.' Raymond appears to have known Arthur Smith Woodward, pp. 139–144.)

Read, C. H. 1893. [Observations on an iron statuette believed to have been found in Sussex, exhibited before the Society by Charles Dawson.] *Proceedings of the Society of Antiquaries of London*, ser. 2, **14** (18 May), 359–361 (with discuss). (C. H. Read, Secretary of the Society, stated that the statuette had been 'found in 1877 in Beauport Park, Sussex, in digging in a slag mound (locally called a cinder heap) at a depth of 27 feet, and that human bones were found near the bottom of the heap.' The statuette was clearly Roman in style, and though greatly decayed it appeared to represent a miniature copy of a horseman from the Quirinal at Rome. An attempt had been made to ascertain whether the figure was of wrought or cast iron (Dawson himself thought it to be the latter). An analysis by W.C. Roberts-Austen (Professor of Metallurgy at the Royal School of Mines) concluded that it was not of cast iron. In the discussion that followed, A. H. Smith exhibited another statuette of the same design in bronze which had been obtained in southern France and was stated to be Roman, though he considered it to be modern. The general view of the meeting was that the statuette was a modern replica. This was not the outcome that Dawson had wanted and he continued to gather evidence to support a view that would eventually emerge in his 1903 paper on Sussex iron work. See Russell 2003, 61–70, for a full discussion of this artefact, and Dawson 1903b for links to other published references.)

Reader, J. 1981. *Missing links: the hunt for the earliest man*. London: Collins, 272 pp. (Piltdown Man, pp. 55–81, & bibliography, pp. 252–253. A well-informed account, including a review of the development of ideas on human origins (particularly those of Arthur Keith) which paved the way for the all too neatly-timed appearance of Piltdown Man. John Reader successfully presents the scenario within which the Piltdown drama unfolds. There are also useful chapters on Neanderthal Man, Java Man, Australopithecus, and Peking Man. An expanded and fully updated edition of this work was published by Oxford UP in 2012, 538 pp.)

Reed, C. A. 1983. A short history of the australopithecines: the first find to the death of Robert Broom (1924–1951). In: *Hominid origins: inquiries past and present* / edited by K. J. Reichs. New York: University Press of America, pp. 1–77. (Cited in Fidele 1992)

Reid, C. (contribution to discussion in Dawson & Woodward 1912: Clement Reid, of H.M. Geological Survey, pointed out that no detailed mapping of the superficial deposits ('drift') had yet been carried out by the Geological Survey in the area that includes Piltdown. The speaker had examined the Pleistocene deposits of the Sussex coastal plain, and from his knowledge of these deposits considered that the Piltdown gravels were unlikely to be pre-glacial, or even early Pleistocene. See Geological Survey)

Reynolds, V. 1982. Obituary: Joseph S. Weiner. *Royal Anthropological Institute Newsletter*, no. 52 (Oct), 15–16.

Reynolds, V. (see Miles, H. 2003, and quoted correspondence from Nov 2011 under Chatwin)

Rhodes, J. (photographer) 1925a. Geological Survey and Museum: British photographs: A2942. British Geological Survey, Keyworth. (Shows 'gravel-pit' in Plateau Gravel, Barkham, looking WSW, Apr 1925, with description: 'Current-bedded gravel composed mainly of subangular iron-stained pieces of Tunbridge Wells sandstone and little-worn flints in dark-brown to black sand, feebly cemented in places by iron oxide'. This photograph possibly shows Smith Woodward's ongoing excavations in a trench on the N side of the hedge that runs beside the driveway at Barkham Manor: Rhodes 1925b, Toombs 1952. The image is preserved as a glass-plate negative (possibly now degraded) and a bromide print pasted into an album. See also Edmunds 1925.)

Rhodes, J. (photographer) 1925b. Geological Survey and Museum: British photographs: A2943. British Geological Survey, Keyworth. (View of Barkham, looking NW, Apr 1925, 'Showing top of plateau in which the "*Eoanthropus* gravel" forms a thin capping to the Tunbridge Wells Sand; the shallow pits in which remains of *Eoanthropus* were first observed are between the low firs and the hedge in the background, near middle of view; the k-shaped wooden memorial to *Eoanthropus dawsoni*...on the hedge-bank, can be seen with a lens; the pit shown in No.2942 is on the farther side of the same hedge'. The wooden memorial was put up in 1923, as described by Kenward 1955b. The image is preserved as a glass-plate negative (possibly now degraded) and a bromide print pasted into an album.)

Rhodes, J. (photographer) 1925c. Geological Survey and Museum: British photographs: A2946. British Geological Survey, Keyworth. (View of Crink Hill, just N of Barcombe Mills Station, looking NW, Apr 1925, 'Part of a gravel-capped plateau...near Barcombe Mills; the top of the plateau, about 60ft above the River Ouse, is seen beyond the trees'. This photograph appears to be an attempt to record the place where

Dawson supposedly found the Barcombe Mills skull fragments and molar tooth, on the strength of a statement received from Smith Woodward which is recorded in White 1926, 67. The Natural History Museum register records the find locality as 'Pleistocene gravel in field on top of hill above Barcombe Mills railway station': cited in Walsh 1996, 62. The image is preserved as a glass-plate negative (damaged) and a bromide print pasted into an album. Good edited scans of all three prints (Rhodes 1925a–c) have been prepared by this Compiler and will be added to the BGS Geoscience Imagebase archive. The official scans are worthless.)

Roberts, N. K. 2000. *From Piltdown Man to point omega: the evolutionary theory of Teilhard de Chardin*. New York: Peter Lang Publishing Inc, 251 pp. (Studies in European Thought, vol. 18). (Touches on the question of why there are so few references to Piltdown in Teilhard's later works)

Rock, J. 1879. Ancient cinder-heaps in East Sussex. *Sussex Archaeological Collections*, **29**, 167–180. (It has been suggested by Walsh 1996, 175, 177, that Dawson was alerted to the Beauport Park site by the reading of this paper)

Robertson, E. 1984. Hen's teeth and horse's toes. *Teilhard Review*, **19** (2), 65–67. (A response to Gould)

Rolland, N. 1992 (contribution to discussion in Tobias 1992c: the writer considers that Tobias 'provides a convincing case, as far as the evidence cited goes, that Keith was the main culprit.' He confines his remarks to a discussion of the influence that a belief in Piltdown man had on 'the interpretation of the fossil human Palaeolithic records in Western Europe, even after the fraud was uncovered. This had much to do with the notion of a separate "Presapiens" hominid lineage coexisting for much of the Pleistocene with the forbears of the classic Neandertals.' Piltdown contributed 'to a viewpoint favouring a two-lineage model of hominid evolution within Western Europe that supplied alternative blueprints for interpreting Palaeolithic evidence there.')

Rosen, D. 1968. The jilting of Athene. *New Scientist*, **39** (5 Sept), 497–500. ('Athene is the goddess of wisdom and of the arts and sciences. Although the great majority of scientists are true to their profession and the spins of the goddess, a few are less scrupulous... This should occasion no surprise: scientists are members of society and in societies where duplicity pays off, a scientist anxious for prestige or a bigger research grant or both may feel irresistibly tempted to make fanciful claims. A more serious matter...is that rather few known cases of fraud are publicly exposed as such by those in a position to do so. As a result, it is possible to make a private collection of instances, most of which cannot be published because of the libel laws...' At the top of Rosen's list comes Piltdown, but his acceptance of Dawson as the forger prompted a letter from Chamberlain 1968.)

Ross, A. J. 2004. The Piltdown Fly and other amber fakes. In: *Geofakes, frauds and hoaxes*, abstracts of a meeting organised by the History of Geology Group, under the aegis of the Geological Society of London, Burlington House, London, 22 October 2004, p. 1. (Amber is a popular material for two reasons: firstly for jewellery and secondly for the exquisite preservation of animals – particularly insects – and plant remains within it, so it is often faked. One such fake was discovered in the Natural History Museum collections in 1993 and named the 'Piltdown Fly'.)

Runnels, C. 1992 (contribution to discussion in Tobias 1992c: 'The convincing review offered by Tobias will serve to throw additional suspicion upon Keith, but to my mind there is still every reason to regard Dawson as the forger... The argument has often been made that the forgery was too clever and required too much detailed scientific knowledge to have been carried out by an amateur. Some scientists find it hard to believe that an amateur could have duped the entire scientific establishment...')

Russell, M. 1999. Of flint mines and fossil men: the Lavant Caves deception. *Oxford Journal of Archaeology*, **19**, 497–500. (Charles Dawson appears to have introduced spurious artefactual evidence into the Lavant underground chalk workings during the course of excavation. Nothing was formally published and the caves were afterwards permanently sealed. Although see Dawson 1893c)

Russell, M. 2003. *Piltdown man: the secret life of Charles Dawson and the world's greatest archaeological hoax*. Stroud: Tempus, 288 pp. (Some 33 cases involving Dawson are examined for evidence of fraud. Many of these can be dismissed as mild plagiarism, misidentification, over-imagination, sloppiness or naivety on Dawson's part. Even where fraud is suspected, there are surprisingly few instances where it can be definitely proven. The book suffers a little from inadequate proof-reading and omitted citations, but is the most detailed published record of Dawson's dodgy and sometimes dastardly dealings. The following cases are examined: *Plagiaulax dawsoni*; Lavant Caves; Hastings Castle 'dungeons'; Castle Lodge purchase; Blackmore's stone axe; the Bexhill boat; the Beauport Park statuette; the Uckfield horseshoe; the Herstmonceux fireback; the Chiddingfold dog gate; the Lewes prick spur; the Bermondsey Abbey curfew; the Hastings mace; the 'Arabic' anvil; the Beauport Park axe; the Bulverhythe hammer; the St Leonards bronze hoard; Sussex loops; the

Chinese vase; the Pevensey bricks; dene holes; Sussex iron, pottery and glass; the Bayeux Tapestry; *History of Hastings Castle*; the 'Red Hills' of Essex; natural gas at Heathfield; 'Toad in a Hole'; sea serpents in the English Channel; thirteenth dorsal vertebra; the Hastings Rarities; the Maresfield Map; the Ashburnham dial; Piltdown assemblage. Regarding Russell's crucial assessment of the molar tooth of *Plagiaulax dawsoni* it is by no means clear where he derives his evidence for 'artificial' abrasion, since the crown of the tooth has long been lost, for details of which see Farrant 2013, App 4. Russell made extensive use of the unpublished work of Downes 1956. For a book review see Currant 2004b.)

Russell, M. 2004. X-filed fossils. *British Archaeology*, no. 75 (Mar), 34. (A response to the article by Pitts 2004, which included edited extracts from a series of articles about the activities of Charles Dawson, written by the unidentified C.F.E.B. Russell thinks that 'CFEB was either Robert Downes, a Birmingham University graduate who was writing a book, never published, on Dawson 1953–56...or a local writer who had spoken with Downes.' He states that 'much of what CFEB says is word for word Downes' manuscript', though he cannot explain the CFEB pseudonym. A more likely explanation is that Downes copied his information from CFEB, since the newspaper articles in question are amongst the Downes papers. Russell wearily concludes 'It is a little annoying that, given the mass of data demonstrating Dawson was a great antiquarian fraud and serial hoaxer, so many continue to prolong the conspiracy theory. I suppose that's the legacy of the X-Files.')

Russell, M. 2012. *The Piltdown Man hoax: case closed*. Stroud: The History Press, 157 pp. (This is a rather more successful reworking of Russell 2003, including additional matter. For a brief review see Cole, J. 2013)

Russo, F. 1974. Supercherie de Piltdown: Teilhard de Chardin et Dawson. *La Recherche*, **5**, no. 43, 293.

Rutherford, B. A. 2000. *Facts and fallacies of the fossil record: re-evaluating the supposed evidences for human evolution*. Winona, MS: J. C. Choate Publications, available online. (Lessons 11 & 12: The Piltdown hoax: another black eye for human evolutionary theory, parts one and two. More nonsense from the US anti-evolution movement. The claim is made that both the Ipswich and Galley Hill finds were 'infamous hoaxes', whereas they were nothing of the sort. In posing the question, why did Dawson perpetrate the Piltdown fraud, we are presented with the following skewed interpretation: 'His intent was obviously not to embarrass the prominent evolutionists of his day. He strongly believed in the theory of human morphology. [What does that mean?] Perhaps he wanted fame or acceptance from his colleagues? [This is indeed the most likely interpretation from what we know of Dawson's character.] No one will ever really know what motivated him to create such a masterful deception. One can say that desperate men often perform desperate acts. Charles Dawson may have been such a man. The highly criticized theory of evolution was in dire need of some substantial evidence. Perhaps this is why he decided to fabricate some? [Or perhaps not!] Dawson is not unlike evolutionists today who continue to weave a web of masterful lies and deceit.' Enough said! But see comments under North 1981, which might give a clue to Brett Rutherford's skewed profile of Dawson.)

Rutot, A. L. 1913. Nouvelles découvertes relatives à l'homme du Sussex (*Eoanthropus Dawsoni*). *Bulletin de la Société Belge de Géologie, de Paléontologie et d'Hydrologie*, **27** (Nov), 182–184.

Rutot, A. L. 1919. Un essai de reconstitution plastique des races humaines primitives. *Mémoire de l'Académie royale de Belgique, Classe des beaux-arts*, 2e sér, **1**, 172 pp, 15 plates. (This work may include a photograph of a bust of *Eoanthropus* modelled by Louis Rutot and the sculptor M. Masere. Rutot wrote to Smith Woodward in July 1914 with respect to this reconstruction, on which he was then working; see Spencer 1990b, 110–111. Not seen)

Salter, E. M. & Kolar, J. C. 1993. Skeletal biology in the twentieth century: from Piltdown to the present. *Reviews in Anthropology*, **22**, 153–164. (Not seen)

Salzmann, L. F. 1908. Excavations at Pevensey, 1906-7. *Sussex Archaeological Collections*, **51**, 99–114, plates 9–16 (2 folded). (Records the discovery of a fragment of blue black tile or brick, stamped with an inscription (ON AVG NDR) which is incomplete, but can be compared with a perfect example from the same stamp in the possession of Charles Dawson, HON AVG ANDRIA, pp. 111–113. See Dawson 1907b. These brick-stamps are now known to be modern forgeries: see Peacock 1973.)

[**Salzmann, L. F.**] 1910. Notices of books relating to Sussex: *The History of Hastings Castle and Rape*, by C. Dawson, F.S.A. *Sussex Archaeological Collections*, **53**, 282. (The reviewer remarks that this new work 'contains a great deal of material relating to East Sussex mingled with a certain amount of general history, not always accurate... The author has displayed much industry in collecting material but little judgement in its selection and arrangement. Apart from errors of translation the misreadings are extremely numerous. It is difficult to say how far these are due to carelessness, inaccuracy and neglect of proof reading, and how far to reliance upon second-hand authorities, as references are frequently omitted or given in an unintelligible form.

In many cases when matter is taken, mistakes and all, from earlier writers no acknowledgment of the source is made...')

Salzman, L. F. 1946. A history of the Sussex Archaeological Society. *Sussex Archaeological Collections*, **85**, 2–76. (Makes reference to Dawson's acquisition of Castle Lodge in 1903, noting that it was 'entirely unexpected and naturally caused something like consternation. It was ultimately to prove highly beneficial to the Society, but for the moment the blessing was very thoroughly disguised.' In a footnote to this account, p. 38, Salzman takes a swipe at Dawson with remark that 'His name was later given to the 'Pilt Down Man' (*Eoanthropus dawsoni*), the lowest known form of human being, with the discovery of whose remains he was associated.' This footnote constitutes the only reference in Salzman's history to the most important archaeological 'discovery' made in Sussex up to that time! A photograph of 'L. F. Salzman, F.S.A./ Hon. Editor 1909–1946', features on p. 62, and shows him sitting in the Society's Library at Barbican House, looking very much as it does to this day. A photograph of Castle Lodge, c.1890, features on p. 34. See also comments under Holden 1980b)

Salzman, L. F. 1953. [Notice concerning Charles Dawson]. *Sussex Express & County Herald*, 27 Nov. (Not seen)

Salzman, L. F. 1955a. The truth at last. In: Anon. 1955b.

Salzman, L. F. 1955b. Piltdown mystery. *Sunday Times*, 23 Jan. ('Sir—In the second instalment of your "Piltdown Mystery" [Emerson & Weiner 1955b] I am represented as responsible for the statement that "In 1903 the other members of the (Sussex Archaeological) Society asked Dawson to act on their behalf in negotiating the sale to them of Castle Lodge." This is completely untrue; there was no suggestion of the Council employing Mr. Dawson as their agent...' To this short letter is appended Weiner's response, from which it appears that the misunderstanding arose over Dawson's having utilised the Society's notepaper in his negotiations for the house, which Weiner now realises was a completely unauthorised act on Dawson's part. A correction to this effect appeared in the 2nd impression of Weiner's *The Piltdown forgery*.)

Sarjeant, W. A. S. 1993. Lambert Beverly Halstead, 1933–1991: his life, his discoveries and his controversies. *Modern Geology*, **18**, 1–81.

Saunders, C. 1990. Piltdown hoaxter takes flight. *Times Higher Education Supplement*, 26 Oct, 12. (Response to Bowler 1990. Implicates Chipper, the goose. Cited in Turrin 2006.)

Savage, R. J. G. 1963. Martin Alister Campbell Hinton, 1883–1961. *Biographical Memoirs of Fellows of the Royal Society*, **9**, 155–170, plate.

Sawday, J. 1999. "New men, strange faces, other minds": Arthur Keith, race and the Piltdown affair, 1912–53. In: *Race, science and medicine, 1700–1960* / edited by W. Faust & B. Harris. London: Routledge, pp. 259–288. (Not seen)

Schaaffhausen, H. 1858. Zur Kenntnis der ältesten Rassenschädel. *Archiv für Anatomie, Physiologie und wissenschaftliche Medizin*, for 1858, 453–478, plate XVII. (Uncovered by workmen when a cave deposit was disturbed during quarrying operations in the Neander valley (Neanderthal), near Düsseldorf, the partial remains of a human skeleton of peculiar form were recognised by a local schoolmaster Johann Carl Fuhlrott in August 1856, though it is likely that much of the skeleton was lost before its significance was appreciated. The parts of the skeleton which have been preserved include the skullcap, a clavicle and scapula, five ribs, several limb bones, and part of the pelvis. Neither artefacts nor fossil mammalian bones were found with the remains. This formal published description of the skeleton had been preceded by two short notices in 1857 (see Quenstedt 1936, 220). Schaaffhausen recognised the peculiar features of the bones, which he thought must have belonged to a savage and barbarous race forming the most ancient record of the early inhabitants of Europe. On the other hand, professor F. Mayer of Bonn claimed the skeleton was probably that of a bow-legged Mongolian Cossack who, on his way through Germany towards France in 1814, had crept into the cave and died! Years of controversy followed, with some anthropologists arguing that the skull was pathological, or that it belonged to an imbecile. Huxley 1863 recognised the primitive features of the skeleton but did not consider it to form a link between man and apes, regarding it merely as an extreme variant of *Homo sapiens*. However, William King, an Irish anatomist, considered that the shape of the skullcap, with its large brow ridges, was distinct enough to indicate a separate species, and at the 1863 meeting of the British Association in Newcastle he proposed the name *Homo neanderthalensis*, the first new species of fossil human, which he formally published the following year: see King 1864. For an English translation of Schaaffhausen's paper see Busk 1861, also quoted in Huxley 1863.)

Scheuer, A. 1974a. Ask the Piltdown Man. *The Times*, 4 Apr, 21. (In response to a letter from Steer 1974 concerning the function of learned societies, the writer, in defence of the amateur Dawson, launches into an anti-establishment criticism of the role of Smith Woodward and the Natural History Museum, which enjoyed the benefits of having found the missing link between ape and man, whereas 'Dawson was no more than a stooge.' He notes that Steer's predecessor as President of the Sussex Archaeological Society, L. F. Salzman, had (contemptuously) described Dawson as 'a small-town solicitor' with a 'burning desire to be famous.')

Scheuer, A. 1974b. The Piltdown forgery. *The Times*, 24 Apr, 17. (In another swipe at the scientific establishment the writer suggests that John Cooke's painting, *A Discussion of the Piltdown Skull* (1915, but here dated to 1924) 'shows the hoaxers, not the hoaxed.' He claims that Teilhard de Chardin had 'declined to appear in the painting'. The painting was executed during 1914, by which time Teilhard was in France and probably not available for a sitting, assuming he was ever asked, which seems unlikely given that he did not participate at the discussion purportedly represented in the painting: see Cooke 1915. Scheuer's letter prompted a response from Weiner 1974. While Scheuer's branding of the participants in the famous painting as 'the hoaxers, not the hoaxed' may seem jaundiced, in some ways he was not so far from the truth!)

Schmerling, P.-C. 1833. Sur des cavernes à ossemens de la province de Liège. *Bulletin de la Société géologique de France*, **3**, 217–222. (This appears to be the first announcement of this now celebrated discovery of ancient human remains in a cave at Engis, near Liège, in 1829. Paper read 18 March 1833. See next entry for details.)

Schmerling, P.-C. 1833–34. *Recherches sur les ossemens fossiles découverts dans les cavernes de la province de Liège*. Liège: P.-J. Collardin, 2 vols+atlas. (Vol. 1, 1833, Ch. III. Des ossemens fossiles humains, pp. 53–66, plates I–IV (in atlas): records the discovery, made between 1829 and 1830, of two partial human skulls in a cave at Engis, near Liège, Belgium. Other human remains were found in the cave of Engihoul, opposite that of Engis. The caves also yielded worked implements. Charles Lyell visited Schmerling's excavations and cited the finds in the third edition of his *Principles of Geology* in 1834. Yet he and others remained cautious about their significance. Concerning the two Engis skulls, Stringer (2006, 15) notes that 'direct radiocarbon dating now suggests that one is actually less than 10,000 years old, another (the skull of a child) was finally recognized in 1936 as belonging to a Neanderthal' making it the first discovery of its kind. Huxley 1863 provides a translation of Schmerling's account. It may be noted here that one of the first fossil humans known to science was found by William Buckland in 1823 in a cave on the Gower Peninsula, South Wales. The so-called Red Lady of Paviland, actually a man, is a modern *Homo sapiens* of Upper Palaeolithic age.)

Schmitz-Moormann, K. 1981a. The Stephen Jay Gould hoax and the Piltdown conspiracy. *Teilhard Review*, **16** (3), 7–15. (Not seen)

Schmitz-Moormann, K. 1981b. Teilhard and the Piltdown hoax. *Teilhard Newsletter*, **14**, (1) July, 2–4. (Defends Teilhard de Chardin against Gould's accusation of complicity in the Piltdown affair, based on an examination of Teilhard's letters from this period. Dr Karl Schmitz-Moormann is editor of eleven volumes of Teilhard's scientific writings.)

Schoetensack, O. 1908. *Der Unterkiefer des Homo Heidelbergensis, aus den Sanden von Mauer bei Heidelberg*. Leipzig: Verlag von Wilhelm Engelmann, 67 pp, 13 plates. (A robust and somewhat primitive human mandible was discovered in a sand quarry at Mauer, south-east of Heidelberg, Germany, in 1907. A well preserved mammalian fauna was found in association with the jaw, but no artefacts were discovered. There can be little doubt that Heidelberg was the seed that led to the creation of Piltdown Man. While the discovery of the first Piltdown fragment in 1908 may have been coincidental, subsequent events would be determined by Dawson's over-optimistic expectation of finding England's answer to Heidelberg.)

Schreider, E. 1973. Teilhard de Chardin: une victime de l'homme de Piltdown. *La Recherche*, **4**, no. 32, 301.

Schrier, E. W. 1983. The case of the faked fossil. *Science* **83**, **4** (7) Sept, 5. (Editorial giving the background to John Winslow's revelations concerning Conan Doyle's claimed involvement in the Piltdown fraud. See Winslow & Meyer 1983)

Schwalbe, G. 1914. Kritische Besprechung von Boule's Werk 'L'Homme fossile de la Chapelle-aux-Saints.' *Zeitschrift für Morphologie und Anthropologie*, **16**, 527–610. (In touching upon the subject of Piltdown, the writer is unwilling to accept the proposition that the Piltdown jaw and skull belong to the same individual, pp. 597, 603–604, 606. From Spencer 1990b, 56, though Miller 1915, 27, reads the opposite viewpoint!)

Schwartz, I. 1994. *The Piltdown confession: a novel*. New York: A Wyatt Book for St. Martin's Press, [x], 210 pp. (Described as 'an amazing blend of fine historical documentation and artful fiction', including

bibliographical references and notes. Concerns a signed confession of guilt written by Dawson in the year of his death and subsequently kept in safe-keeping until 2008, the centennial anniversary of the clandestine deposit of a human parietal bone fragment at Piltdown. The confession names two co-conspirators, Teilhard de Chardin, eager to get one over on the crackpot creationists, and Arthur Conan Doyle. Dawson had determined never to admit to the fraud during his lifetime for fear of assassination.)

Sergi, G. 1914. *L'evoluzione organica e le origini umane: induzioni paleontologiche*. Torino: Bocca, 240 pp. (Discussion of Piltdown finds, pp. 192–198, 236. Cited in Quenstedt 1936)

Sergi, G. 1914. La mandibola umana. *Rivista di Antropologia*, **19**, 119–168. (Piltdown jaw, pp. 166–167; the writer accepts without reservation Woodward's reconstruction of *Eoanthropus*)

Sergi, G. 1914. Scoperta di un nuova fossile umano. *Archivio di antropologia criminale, psichiatria e medicina legale*, **35**, 84. (Cited in Quenstedt 1936)

Sergi, G. 1916. *Problemi di scienza contemporanea*. Torino. (Discussion of Piltdown, pp. 111–117. Cited in Quenstedt 1936)

Seward, A. C. 1913. A contribution to our knowledge of Wealden floras, with especial reference to a collection of plants from Sussex. *Quarterly Journal of the Geological Society of London*, **69** (1), 85–116 (with discuss), plates XI–XIV. ('In November of last year (1911) Mr. Charles Dawson, F.S.A., F.G.S., submitted to me for examination a small collection of plants obtained by him, with the able assistance of Father Teilhard de Chardin and Father Félix Pelletier, from the Wealden Beds of Sussex, for the most part from the neighbourhood of Fairlight. Several of the specimens, although specifically identical with previously recorded types, are better preserved or larger than any hitherto found, and furnish new facts of importance. The collection includes also several new species. In accordance with Mr. Dawson's wish, the specimens have been handed to Dr. Smith Woodward as a gift to the Geological Department of the British Museum (Natural History). With [one] exception...which is from the Ashdown Sands, the fossils in the Dawson Collection were obtained from the Fairlight Clay.' The new species include *Lycopodites teilhardi*, *Selaginellites dawsoni*, *Hausmannia pelletieri*, *Pelletieria valdenis*, gen. et sp. nov., *Teilhardia valdensis*, gen. et sp. nov., and *Dichopteris delicatula*. Dawson contributed to the discussion which followed the reading of this paper. The paper as printed is immediately followed by the first Piltdown paper.)

Shapiro, H. L. 1981. Earnest A. Hooton, 1887–1954: *in Memoriam cum amore*. *American Journal of Physical Anthropology*, **56** (4), 431–434.

Shattock, S. G. 1914. Morbid thickening of the calvaria, and the reconstruction of bone once abnormal: a pathological basis for the study of the thickening observed in certain Pleistocene crania. In: *Proceedings, 17th International Congress of Medicine, London, July 1913, Sect. VII, part 2*, pp. 3–46. (The Pleistocene Piltdown cranium, pp. 42–46 & plate. The writer accepts the association of the skull with the jaw, and regards the third molar as un-erupted. In respect of the thickened skull he notes that 'Without making any dogmatic statement, certain details of the Piltdown calvaria suggest the possibility of a pathological process having underlain the thickened condition.')

Shaw, D. C. 2005. Piltdown and science. *Skeptical Inquirer*, **29** (3), 63. (Response to Pigliucci 2005)

Sheail, J. 1996. From aspiration to implementation – the establishment of the first National Nature Reserves in Britain. *Landscape Research*, **21**, 37–54. (Including the Piltdown Man Site. Not seen)

Sheail, J. 1998. *Nature conservation in Britain – the formative years*. London: HMSO, 282 pp.

Shermer, M. 2001. *The borderlands of science: where sense meets nonsense*. Oxford: Oxford University Press, 360 pp. (Piltdown, pp. 307–319. Not seen.)

Shindler, K. 2005. *Discovering Dorothea: the life of the pioneering fossil-hunter Dorothea Bate*. London: HarperCollins Publishers, ix, 390 pp, [16] plates. (Dorothea Bate was employed at the Natural History Museum, curating birds and Pleistocene mammals, at the time of the Piltdown discoveries, though she seems not to have left any personal impression of this significant event, pp. 199–202, 203. Useful insights are provided in regard to the workings of the Geology Department under Smith Woodward at this time.)

Shipman, P. 1990. On the trail of the Piltdown fraudsters. *New Scientist*, **128** (6 Oct), 52–54. (A review of Frank Spencer's researches, based on an interview with the author, for *Piltdown: a Scientific Forgery* and *The Piltdown Papers*, published in 1990.)

Shipman, P. 1992. Face to face with deception. *New Scientist*, **135** (22 Aug), 41. (Reports a cottage industry in Java involving the production of faked skulls of the Javanese *Homo erectus*. The author asks, ‘Will the Javan fakes provide Piltdown-like confusion? Not likely... Yet these skulls are poignant testimony to the impact of science on local communities.’ See also Taggart 2004.)

Sicher, H. 1937. Zur Phylogenese des Menschlichen Kiefergelenkes nebst Bemerkungen über den Schädelfund von Piltdown. *Zeitschrift für Stomatologie*, **35**, 269–275. (Following a careful study of the Piltdown jaw, the author notes that the configuration of the dental foramen and its relation to the mandibular canal is completely non-human and throws doubt on the association between the jaw and skull: cited in Weiner 1955a, 232. Sicher evidently suspected fraud: Weiner 1974)

Sieveking, A. 1980. A new look at the Sherborne bone. *Nature*, **283** (21 Feb), 719–720. (A response to Farrar 1979. The writer states that there is little evidence to support a renewed claim for the authenticity of the Sherborne engraved bone. A detailed case is presented in support of its being fraudulent.)

Sieveking, A. 1981. More on the Sherborne bone. *Antiquity*, **55**, no. 215, 219–220. (A reply to Farrar 1981)

Sieveking, P. 1996. Found in the loft: the bones of a hoax. *Daily Telegraph*, 10 Aug. (The writer thinks that Gardiner & Currant 1996 have conclusively established Martin Hinton’s credentials as the Piltdown perpetrator. He adds: ‘I remember Martin Hinton with long white hair and baggy trousers, sitting in his study at Glaisters in Wrington, near Bristol, surrounded by monkey skulls and other macabre objects. After his death, his daughter gave me many of these—including a Romano-British skull and a piece of linen unrolled from an Egyptian mummy—which have pride of place in my collection. I wish I could recall Dr Hinton from the grave for a confidential tete-a-tete.’ From Piltdown Plot website, and cited Turritin 2006)

Silverberg, R. 1965. *Scientists and scoundrels: a book of hoaxes*. New York: Thomas Y. Crowell, 251 pp. (Including, of course, Piltdown, pp. 220–234. Not seen)

Simpson, G. G. 1928. *A catalogue of the Mesozoic Mammalia in the Geological Department of the British Museum*. London: Trustees of the British Museum. (Brief description of *Plagiaulax dawsoni*, presented to the museum by C. Dawson, catalogue M13134, from Old Roar Quarry, near Hastings, described as ‘A single badly worn and broken molar tooth. Holotype, figd. Woodward, 1891.’ It is further stated that ‘The enamel is all worn off this crown except around the edges, and all that remains is an irregular ovate basin with a rim of varying height... The tooth is comparable only with equally worn teeth of *Plagiaulax* and it is probably Plagiaulacid, although its generic and specific affinities are quite indeterminable’, pp. 51–52, 192. No other examples of this species are recorded. See also Clemens 1963. In a letter to Charles Blinderman, dated 21 Sept 1984 (quoted in full by Gardiner 1987), Simpson states, without being specific, that Dawson had ‘perpetrated a previous hoax’ prior to Piltdown. Might this be in reference to *Plagiaulax dawsoni*? The specimen M13134 was accidentally broken in 1893, as noted by Farrant 2013, 150, 181 n. 23.)

Simpson, G. G. 1984 (for letter to Charles Blinderman concerning his recollections of A. S. Woodward, dated 21 Sept 1984, see Gardiner 1987)

Smith, A. 1959. Alas, poor Piltdown. *Daily Telegraph and Morning Post*, 26 Jan, 11. (‘Piltdown Man is not dead yet. Ever since the story came out five years ago that the famous skull and jaw had been planted as a hoax, a retired dentist from Clapham Common has been working to prove that the hoax story is false. He is Mr. Alvan T. Marston, now 69, who achieved fame by discovering Swanscombe Man, the fossil which is without doubt the most ancient Briton ever found. ...In a long article submitted to but not yet published by the British Dental Journal [possibly never published], Mr. Marston attacks almost everything which suggests that Dawson, or persons unknown, created this hoax. He believes the Piltdown skull is as genuine and human in every way as that of Swanscombe, and he believes that the jaw is also a natural find, although of a large ape... “In short,” says Mr. Marston, “not one iota of scientific evidence has been brought forward to show that Piltdown was a hoax.” It is now up to the biological authorities to show whether Mr. Marston is the greatest victim of all, of the greatest of all hoaxes—or whether he is right.’ Marston’s final claim is both extraordinary and blatantly untrue. Marston was indeed a victim—of his own self delusion.)

Smith, G. E. 1912. [Presidential address to] The British Association at Dundee: Section H. Anthropology. *Nature*, **90** (26 Sept), 118–126. (Address delivered 5 Sept 1912. A discussion of man’s evolution from the early primates, in which Smith argues that the steady growth and specialisation of the brain has been the fundamental factor leading first to the development of an erect stance, and ultimately to the acquisition of the power of speech. At the time of this address, Smith was evidently unaware of the discoveries that had been made at Piltdown (e.g. Smith 1913b). He certainly became aware in about mid-November when he was asked

by Woodward to report on the Piltdown endocranial cast: see Spencer 1990b, p. 35, who quotes a letter to the French neuro-anatomist, Raoul Anthony, dated 21 Nov, in which Smith writes: 'I do not know whether you have heard that a very (pre-Heidelberg, said to be Pliocene) skull has been found in England and I want to be able to compare the brain-cast with your La Quina cast next week.' This was written on the same day that the *Manchester Guardian* announced the Piltdown discovery. A more complete version of Smith's address appeared in *Report, British Association for the Advancement of Science*, Dundee, 1912, 575–598, published 1913.)

Smith, G. E. 1913a. Preliminary report on the cranial cast [of the skull from Piltdown.] *Quarterly Journal of the Geological Society of London*, **69** (1), 145–147. (Appendix to Dawson & Woodward 1913; abstract in *Abstracts of the Proceedings of the Geological Society of London*, no. 932, 28 Dec 1912, p. 22.)

Smith, G. E. 1913b. The Piltdown skull. *Nature*, **92** (2 Oct), 131. (Further remarks to Smith 1913a. He notes that 'The small and archaic brain and thick skull are undoubtedly human in character, but the mandible, in spite of the human molars it bears, is more simian than human. So far from being an impossible combination of characters, this association of human brain and simian features is precisely what I anticipated in my address to the British Association at Dundee (*NATURE*, September 26, 1912, p. 125), some months before I knew of the existence of the Piltdown skull, when I argued that in the evolution of man the development of the brain must have led the way.'))

Smith, G. E. 1913c. The Piltdown skull and brain cast. *Nature*, **92** (30 Oct), 267–268; (13 Nov), 318–319. (Exchanges with Keith 1913h on the validity of Woodward's restoration of the Piltdown skull)

Smith, G. E. 1913d. The controversies concerning the interpretation and meaning of the remains of the dawn-man found near Piltdown. *Nature*, **92** (18 Dec), 468–469. (Abstract of presentation made to the Manchester Literary and Philosophical Society on 18 Nov. See Smith 1914b. The presentation was also reported earlier in the *Manchester City News*, 22 Nov.)

Smith, G. E. 1914a. On the exact determination of the median plane of the Piltdown skull. *Quarterly Journal of the Geological Society of London*, **70** (1), 93–97. (Appendix to Dawson & Woodward 1914a; abstract in *Abstracts of the Proceedings of the Geological Society of London*, no. 949, 31 Dec 1913, p. 29)

Smith, G. E. 1914b. The controversies concerning the interpretation and meaning of the remains of the dawn-man found near Piltdown. *Memoirs and Proceedings of the Manchester Literary and Philosophical Society*, **58**, 31 Mar, vii–ix. (Reported in *Nature* some three months earlier, Smith 1913d)

Smith, G. E. 1914c. The significance of the discovery at Piltdown. *Bedrock: A Quarterly Journal of Scientific Thought*, **3** (Apr), 1–17. (A detailed response to Keith 1914a)

Smith, G. E. 1914d. Prehistoric man. *Proceedings of the Royal Philosophical Society of Glasgow*, **45**, 17–27. (Not seen)

Smith, G. E. 1915a. Reviews: A Guide to the Fossil Remains of Man in the Department of Geology and Palaeontology in the British Museum (Natural History)...[by A. S. Woodward]. *Geological Magazine*, dec. 6, **2** (3) Mar, 129–132. (The reviewer expresses a number of personal convictions with regard to the interpretation of the Piltdown skull)

Smith, G. E. 1915b. *Prehistoric man and his story*. London & Philadelphia. (Piltdown, pp. 125–129. Cited in Quenstedt 1936)

Smith, G. E. 1916a. Primitive man. *Proceedings of the British Academy*, **7**, 455–504. (Piltdown, pp. 461, 468–469. Cited in Quenstedt 1936)

Smith, G. E. 1916b. "Men of the Old Stone Age." *American Museum Journal*, **16** (5) May, 319–325. (A review of Osborn 1916, in which several reference to Piltdown are made)

Smith, G. E. 1916c. The cranial cast of the Piltdown skull. *Man*, **16**, 131–132. (A response to W. Wright's evident support for Professor Symington's criticism of the writer's interpretation of the endocranial cast of *Eoanthropus*. See Wright, W. 1916a–b.)

Smith, G. E. 1916d. Observations on recently discovered fossil human skulls. *Nature*, **98** (30 Nov), 258–259. (Talgai and Boskop. Abstract of a paper read before the Manchester Literary and Philosophical Society on 31 Oct.)

- Smith, G. E.** 1916e (see Smith, S. A. 1918, concerning the Talgai skull)
- Smith, G. E.** 1916f. New phases of the controversies concerning the Piltdown skull. *Memoirs and Proceedings of the Manchester Literary and Philosophical Society*, **60**, xxviii–xxix. (Not seen)
- Smith, G. E.** 1917. The problem of the Piltdown jaw: human or sub-human? *Eugenics Review*, **9** (July), 167.
- Smith, G. E.** 1918. On the form of the frontal pole of an endocranial cast of *Eoanthropus dawsoni*. *Quarterly Journal of the Geological Society of London*, **73** (1) for 1917, 7–8; appendix to Woodward 1918. (Considers that the fragment of frontal bone corroborates the primitive and ape-like nature of *Eoanthropus dawsoni*)
- Smith, G. E.** 1925a. The fossil anthropoid ape from Taungs. *Nature*, **115** (14 Feb), 235. (Reaction to the announcement by Dart 1925 of his discovery of *Australopithecus*)
- Smith, G. E.** 1925b. The reconstruction of the Piltdown skull. *Proceedings of the Anatomical Society*, **59**, 38–40. (Not seen)
- Smith, G. E.** 1926. Casts obtained from the brain cases of fossil men. *Natural History*, **26**, 294–299. (*Pithecanthropus*, *Eoanthropus*, La Chapelle-aux-Saints and Rhodesia)
- Smith, G. E.** 1927. *The evolution of man: essays*. 2nd ed. London: Humphrey Milford, Oxford University Press, 195 pp. (The Piltdown skull, pp. 71–73: ‘The foregoing pages represent (with some recent additions) the substance of an address to the British Association delivered in the autumn of 1912. Within the month after its delivery a dramatic confirmation was provided of the argument that in the evolution of Man the brain led the way.’ The reconstruction of the Piltdown skull, pp. 74–84, including detailed drawings of the reassembled cranial fragments. See also pp. 96, 101, 103, 105–107, 126. The first edition of this work was published in June 1924 but in respect of the Piltdown skull included only the BA address of 1912.)
- Smith, G. E.** 1930a. The ancestry of man. *Bulletin of the Geological Society of China*, **9** (3), 191–194. (The discovery of abundant remains of *Sinanthropus*, whose geological age and associations are unquestionable, sheds new light on the previously irreconcilable evidence presented by *Pithecanthropus* and *Eoanthropus*. ‘It puts an end to the perennial controversies as to whether *Pithecanthropus* was human or Simian, or whether the ape-like jaw of the Piltdown man could really be associated with his obviously human skull’.)
- Smith, G. E.** 1930b. The revelatory brain-case of *Sinanthropus* (the Peking man). *Illustrated London News*, **176**, 769–771, 810. (Comparison with *Eoanthropus*, pp. 769, 810. Cited in Quenstedt 1936, where it is stated that this paper is the same as Smith 1930c, II)
- Smith, G. E.** 1930c. *Sinanthropus*, the Peking Man. I and II. *Scientific American*, 440–441, 188–189.
- Smith, G. E.** 1930. *Human history*. London & Edinburgh, 509 pp. (*Eoanthropus*, pp. 67, 83–86)
- Smith, G. E.** 1931a. The discovery of primitive man in China. *Antiquity*, **5** (Mar), no. 17, 21–36, plates I–V. (The author believes that the discovery in China of *Sinanthropus*, or Peking Man, provides a link between both *Pithecanthropus* and *Eoanthropus*, which were previously thought to be irreconcilable. An account is given of the circumstances of Dawson’s discovery of the first Piltdown skull fragments, including a detail not previously recorded. He thus describes how Dawson, having earlier asked the workmen at Barkham Manor to keep a watch for any fossil remains which they might find, returned to the spot in 1912 (actually, about 1908) where ‘he found the workmen, in defiance of the instructions he had given them, throwing stones at what they thought was an old coconut obtained from the gravels. He at once rescued the fossilized remains of a piece of a phenomenally thick human braincase...’ (pp. 23–24). It is likely, as stated in the preface to Elliot Smith’s *The Search for Man’s Ancestors* published in the same year, that his information came directly from Dawson. The story actually has a ring of truth about it.)
- Smith, G. E.** 1931b. New discoveries relating to the antiquity of man, by Sir Arthur Keith. [Book review]. *Nature*, **127** (27 June), 963–967. (Criticises Keith’s claim for a certain resemblance of the London or Lloyds’ skull to the Piltdown skull and his suggestion to include them within the same genus. ‘The widespread suspicion of the authenticity of the Piltdown Man as a valid genus is notorious, and the chief reason for the lack of agreement in human palaeontology. Even to-day many Continental anthropologists refuse even to refer to it in treatises on fossil man or, when they do so, brush it aside as being so doubtful that it is best to ignore it. I have been to some trouble to discover the reasons for the persistence of this attitude. It is not simply because the Piltdown jaw is apelike in general form, so much as the claim that the braincase

associated with it conforms to the type of *Homo sapiens*.' Hence, he continues, it does not help when Keith argues that the cranial features of Piltdown Man are essentially of the modern type.)

Smith, G. E. 1931c. The evolution of man. In: *Early man: his origin, development and culture* / by G. E. Smith, A. Keith, F. J. Parsons, M. C. Burkitt, H. J. E. Peake & J. L. Myers. London: Ernest Bent Limited, pp. 1–46. (*Eoanthropus*, p. 19. Cited in Quenstedt 1936)

Smith, G. E. (Oct) 1931d. *The search for man's ancestors*. London: Watts & Co, 56 pp, 6 plates. (*Pithecanthropus*, Heidelberg and Piltdown, and Peking Man)

Smith, G. E. 1934. Recent discoveries in human palaeontology. *Proceedings 1st International Congress of Prehistoric and Protohistoric Science*, London, 1932. London, pp. 63–65. (*Eoanthropus*, p. 64)

Smith, G. E. & Hunter, J. I. 1925. The reconstruction of the Piltdown skull. *Proceedings of the Anatomical Society*, **59**, 38–40. (Paper presented 12 May 1922, reported in *Nature*, **109**, 3 June 1922, 726; evidently revised for publication in 1925: see Spencer 1990b, 159. A reconstruction of the skull and endocranial cast of Piltdown generally confirms the reconstructions made by Smith Woodward and Pycraft, but differs with regard to the position of the occipital fragment, which assumes a more vertical position. As a result, the cranium falls into complete harmony with the chimpanzee-like jaw.)

Smith, G. E. (see also Anon. 1913f; for an obituary see Wilson, J. T. 1938; Dawson, W. R. 1938 provides a full-length biography; see also Swinton 1976, Zuckerman, S. 1973. Millar 1972 was the first to accuse Smith of being the Piltdown forger, followed by Langham 1978, who subsequently changed his mind and focused instead on Keith. See discussion in Spencer 1990a, 172–173, and Turrill 2006, 24–25.)

Smith, R. (Lord Smith of Marlow) 1990. Preposterous thesis. *Sunday Times*, 30 Sept, 3.10. (Review of *Piltdown: a scientific forgery*, by F. Spencer, 1990. The reviewer's opinion regarding the case against Arthur Keith may be guessed at.)

Smith, R. A. (contribution to discussions in Dawson & Woodward 1912, 1914b, 1915)

Smith, S. A. 1918. The fossil human skull found at Talgai, Queensland. *Philosophical Transactions of the Royal Society of London, Series B*, **208**, no. B.357, 351–387, plates 12–18. (Communicated by G. Elliot Smith and read 7 Dec 1916. Elliot Smith, evidently the younger brother of S. A. Smith, was convinced that the Talgai skull confirmed Smith Woodward's reconstruction of the dentition in the Piltdown skull. See discussion in Spencer 1990a, 93, and G. E. Smith's correspondence with Woodward in Spencer 1990b, 132–3. The Talgai discovery was alluded to by Dawson 1915 as confirming the presence of interlocking canines in Woodward's reconstruction of the Piltdown skull. Dawson notes that by a curious coincidence the skull was found near a place called Pilton. Millar 1972, 237, has suggested that this was a cruel joke on the part of Smith, because 'there is no such place in the whole of Australia.' In fact, Pilton is only some 10 miles from Talgai. On the connection between Piltdown and the rediscovery and public unveiling of Talgai in 1914—it had been discovered as long ago as 1886, but then consigned to obscurity—see Allen 2010.)

Smoker, B. 1997. Piltdown again. *Current Archaeology*, no. 153, 358. (Correspondent was a close friend of Kenneth Oakley, who, in response to her conclusion that Teilhard de Chardin was the guilty party, thought that she was 'probably right'. Teilhard always refused to talk about the matter, as though ashamed of some youthful folly. Oakley later changed his mind, see Daniel 1982.)

Sollas, W. J. 1895. "Pithecanthropus erectus" and the evolution of the human race. *Nature*, **53** (19 Dec), 150–151. (Since there is at present no means of calculating geological time with any certainty, the author here attempts to construct a chart showing the evolution of apes and man set against known thicknesses of the sedimentary succession for the Miocene, Pliocene and Pleistocene periods. He assigns Java man to the beginning of the Pleistocene, and Neanderthal, on the evidence of the Spy remains, to the middle of the Pleistocene. He inclines to the view that the evolutionary line which led through *Pithecanthropus* (Java) and Neanderthal to the modern 'European' may have branched off the anthropoid ape line in the middle part of the Pliocene period: '...and it is to this period that *Anthropithecus sivalensis* of Lydekker, a chimpanzee having affinities with man and Hylobates [gibbons], has been assigned.' Such a line, when plotted against sedimentary thickness, 'suggests that the evolution of the human race has proceeded at a very uniform rate.')

Sollas, W. J. 1908. On the cranial and facial characters of the Neanderthal race. *Philosophical Transactions of the Royal Society of London, Series B*, **199**, no. B.257, 281–339, plate 29. (Description of the small Neanderthal skull from a cave in Gibraltar. Cited by Woodward, in Dawson & Woodward 1913, with reference to the thickness of modern Australian aboriginal skulls.)

Sollas, W. J. 1910. The anniversary address of the President. In: Annual general meeting, February 18th, 1910. *Quarterly Journal of the Geological Society of London*, **65** (2), xlviii–lxxxviii. (Sollas chooses as his special theme a discussion of the origins of man, pp. liv–lxxxviii. Notice is taken of the recent discovery of the Heidelberg jaw, which clearly has simian characters, but in which ‘The dentition is thoroughly human. The incisors and canines have been worn down to a uniform level...’ He notes that, while no implements have been found in association with the jaw, ‘it has furnished an interesting fauna; one of the species (*Elephas antiquus*) suggests the Chellean horizon, another (*Rhinoceros etruscus*) has been found elsewhere in the Upper Pliocene.’ He further makes an illustrative comparison (fig. 5) between the Heidelberg jaw and that of an orangutan. Sollas’s paper might well have provided guidance to the Piltdown forger: thus at Piltdown we have an orang jaw doctored to mimic human dentition, and an associated fauna containing elements datable both to the early Pleistocene and late Pliocene.)

Sollas, W. J. 1911. *Ancient hunters and their modern representatives*. London: Macmillan and Co, xvi, 416 pp. (The opening paragraph of Chapter II: The Antiquity of Man, p. 29, neatly summarises the state of knowledge in late 1911 on the question of man’s origins. The book appeared just a few months before Charles Dawson informed Smith Woodward of his discovery at Piltdown. Sollas writes: ‘The dawn of the human race is supposed to belong to a past more remote than the beginning of the Great Ice age; yet of the existence of man antecedent to that epoch not a vestige of evidence, forcible enough to compel universal belief, has up to the present time been discovered. Even Pithecanthropus, that singular ape-like form, which makes the nearest approach to the genus *Homo*, although referred by its discoverer to the Pliocene, has since been asserted on good authority to belong more probably to the Quaternary epoch.’)

Sollas, W. J. 1913 (contribution to discussion in Dawson & Woodward 1913b: The speaker agreed with the authors’ decision to date the Piltdown gravel to the Pleistocene based on the most recent fossils found in it, but ‘The precise horizon in the Pleistocene was less definitely known; unfortunately, the flints which had been found in association with the skull were not sufficiently characteristic to determine this point.’)

Sollas, W. J. 1914. The formation of ‘rostro-carinate’ flints. *Report of the British Association for the Advancement of Science*, Birmingham, 1913, 788–790. (‘The so-called ‘rostro-carinate’ flints discovered by Mr. Reid Moir at the base of the Red Crag and described by him and Sir E. Ray Lankester are known to have passed through an eventful history since they were first liberated from the parent chalk.’ Indeed, the writer goes on to argue that these supposed artefacts of early man are, like the eoliths, entirely of natural origin. He bases his observations on the discovery of flints exhibiting a rostro-carinate form on the beaches at Selsey Bill. He concludes that the rostro-carinate form is very simple and may be produced by chance blows from the action of the sea. The authorities referred to above are Moir 1911 and Lankester 1912a.)

Sollas, W. J. 1915. *Ancient hunters and their modern representatives*. 2nd ed. London: Macmillan and Co, xiv, 591 pp. (Piltdown man, pp 49–56: ‘Some have regarded such a being as an improbable monster and have suggested that the jaw may not have belonged to the skull, but to a true ape. The chances against this are, however, so overwhelming that the conjecture may be dismissed as unworthy of serious consideration. Nor on reflection need the combination of characters presented by *Eoanthropus* occasion surprise. It had, indeed, been long previously anticipated as an almost necessary stage in the course of human development.’ From Miller 1915)

Sollas, W. J. 1920. A flaked flint from the Red Crag. *Proceedings of the Prehistoric Society of East Anglia*, **3** (2), 261–267, plate XIX. (The flint eolith in question was supplied by J. Reid Moir from the base of the Red Crag exposed in a brickfield near Ipswich. Upon careful examination the writer is inclined to accept that the flake might be of human manufacture. ‘If this specimen has claims to be regarded as an implement, and more definitely as a scraper, we may next enquire whether we have any independent evidence to suggest the existence during Pliocene times of beings intelligent enough to fabricate such a tool.’ He thinks it extremely doubtful whether the genus *Homo* had as yet come into existence in Pliocene times, and he classes the Piltdown skull as Pleistocene in date. ‘But the existence of a tool-making animal in Pliocene times (*Eoanthropus* has been suggested) now being conceded, the whole question assumes another aspect, and I am, for my part, convinced that the balance of probabilities is heavily in favour of the view that the flaking of our “Flaked Flint” was accomplished by human agency.’)

Sollas, W. J. 1924. *Ancient hunters and their modern representatives*. 3rd ed. London: Macmillan and Co, xxxvi, 697 pp. (In this edition Sollas included, for the first time, a note dismissing the Sherborne engraved bone as ‘a forgery perpetrated by some schoolboys’, p. 529 n., Smith Woodward had described it as an authentic Palaeolithic artefact in 1914 (Woodward 1914b). See Woodward 1926 for his response to Sollas’s assertion. Not seen.)

Sollas, W. J. 1926. The Palæolithic drawing of a horse from Sherborne, Dorset. *Nature*, **117** (13 Feb), 233. (A response to Woodward 1926, in which the writer defends his position regarding the fraudulent nature of the Sherborne engraved bone, as stated in Sollas 1924. He had received his information from C. J. Bayzand who was intimately acquainted with the facts. See statement from Bayzand 1926 appended to Sollas's letter.)

Sollas, W. J. (see also under J. A. Douglas, who accused Sollas of complicity in the Piltdown forgery on the flimsiest evidence; for an obituary see Woodward & Watts 1938)

Somerville, E. M. 1996. Piltdown reflections: a mirror for prehistory. *Sussex Archaeological Collections*, **134**, 7–19. (An examination of the history of the Society's relationship with the Piltdown discoveries)

Somerville, E. M. 2012. The Piltdown conference: Truth and Lies from the Deep Sussex Past. *Sussex Past & Present*, no. 128 (Dec), 10. (A brief review of presentations made by John Farrant, Beccy Scott & Andy Shaw, Robert Kruszynski, John McNabb, Miles Russell, Francis Thackeray and Matt Pope. The conference, organised by the the Sussex Archaeological Society, took place at Lewes on 22 September to mark 100 years since the announcement of the discovery of Piltdown on 18 Dec 1912 at the Geological Society. A set of abstracts was issued to delegates, 16 pp. See also Kruszynski 2012. The Geological Society also held its own centenary conference, for details of which see Moody 2012.)

Sommer, M. 2004. Eoliths as evidence for human origins? The British context. *History and Philosophy of Life Science*, **26**, 209–241.

Spaulding, A. C. 1955. Reviews: Further contributions to the solution of the Piltdown problem, by J. S. Weiner [et al.] *American Journal of Physical Anthropology*, **13** (1), 166–167.

Speaight, R. 1967. *Teilhard de Chardin: a biography*. London: Collins, 360 pp.

Spencer, F. 1979. *Aleš Hrdlička MD (1869–1943): a chronicle of the life and work of an American physical anthropologist*. London: University Microfilms International, 2 vols. (It appears that Spencer first came to suspect Arthur Keith of being the Piltdown forger while writing this thesis on the career of Hrdlička, one of the key American critics of Piltdown man —Turritin 2006, 22)

Spencer, F. 1984. The Neandertals and their evolutionary significance: a brief historical survey. In: *The origins of modern humans: a world survey of the fossil evidence* / edited by F. H. Smith & F. Spencer. New York: Alan R. Liss, pp. 1–49.

Spencer, F. 1987. Ape jape: The Piltdown Inquest, by Charles Blinderman. *New Scientist*, **113** (5 Mar), 50–51. (An uncharitable review from one who at this time was preparing his own rival account of the Piltdown forgery. A few months later Blinderman offered to return the compliment by reviewing Spencer's forthcoming book: see 'Piltdown rivals', *New Scientist*, **114**, 7 May 1987, 67.)

Spencer, F. 1988. Prologue to a scientific forgery: the British eolithic movement from Abbeville to Piltdown. In: *Bones, bodies, behavior: essays on biological anthropology* / edited by G. W. Stocking, Jr. Madison: University of Wisconsin Press, pp. 84–116.

Spencer, F. [Oct] 1990a. *Piltdown: a scientific forgery*. London, Oxford & New York: Natural History Museum Publications/ Oxford University Press, xxvi, 272 pp. (A considerable amount of scholarly research is here weakened only by the final chapter in which the writer attempts to implicate Sir Arthur Keith as the forger following a line of enquiry developed by Ian Langham, whose papers, after his death in 1984, were passed to Frank Spencer because he had independently come to the same conclusion. Includes an introduction by Phillip V. Tobias, another supporter of Keith's guilt. Ch. 7, 'Black knights and arrant knaves', discusses the accusations of guilt made against Butterfield, 165–7; Conan Doyle, 167–8; Elliot Smith, 172–3; Abbott, 173–5; Hinton (& Kennard), 175–8; Woodhead & Hewitt, 178–82; and Teilhard de Chardin, 182–7. Ch.8, 'Beyond a reasonable doubt?' presents the case against Keith. As stated by Turritin 2006, Spencer's two books (see also Spencer 1990b) were promoted four months ahead of their release on 2 October. Early reactions from newspapers and popular science journals focused on the accusation against Keith, of which Wilford 1990, in New York, and Nuttall 1990, in London, were among the first to publish articles, followed by Anon. 1990, Stringer 1990a, Levin 1990, and others. Reactions, mostly in defence of Keith, continued following release of the book, e.g. Keith, L. J. 1990, Bowler 1990, Costello 1990a, Zuckerman, S. 1990a, and Chippindale 1990. A number of book reviews likewise focused on the case against Keith, e.g. Anon. 1991, Bowler 1991, Campbell 1991, Fagan 1991, Grigson 1990b, Harrison, G. A. 1990, Kennedy 1991, Langdon 1992a, Marks, J. 1992, Miles, A. E. W. 1991, Shipman 1990, Smith, R. 1990, Stocking 1992, Wade 1990, Zuckerman, S. 1990b.

Turritin 2006, 22– 24, lists others. A picture of Spencer holding a model of the Piltdown skull was used to support an appeal from the NHM against staff cuts: see Tait 1990.)

Spencer, F. [Oct] 1990b. *The Piltdown papers: the correspondence and other documents relating to the Piltdown forgery, 1908–1955*. London, Oxford & New York: Natural History Museum Publications /Oxford University Press, xii, 282 pp. (An indispensable reference tool for the Piltdown researcher, though now in need of revision and expansion since not all of the relevant correspondence held at the NHM is included)

Spencer, F. 1991a. The Piltdown mystery: an exchange. *New York Review of Books*, **38** (1/2) 17 Jan, 58. (Reply to the criticisms of Zuckerman, S. 1990b. Cited in Turritin 2006)

Spencer, F. 1991b. The Piltdown forgery. *Times Literary Supplement*, 18 Jan, 13. (Reply to Grigson 1990b. Cited in Turritin 2006)

Spencer, F. 1991c. Piltdown remains. *American Scientist*, **79**, 388. (Reply to Thomson 1991a)

Spencer, F. 1992 (contribution to discussion in Tobias 1992c: confines himself to underlining certain points in Tobias's case against Keith. One of these is that Keith was aware that the jaw, like the skull, had been treated by Dawson with chromate, a fact withheld from Smith Woodward [hardly of great consequence and possibly even a forgotten assumption on Keith's part]; the other point is too silly to repeat.)

Spencer, F. 1997. Piltdown. In: *History of physical anthropology* / edited by F. Spencer. New York: Garland Publishing, pp. 821–825.

Spencer, F. 2000. Piltdown. In: *Encyclopedia of human evolution and prehistory* / edited by E. Delson, I. Tattersall, J. V. Couvering & A. S. Brooks. New York: Garland Publishing, pp. 559–561. (Cited in Turritin 2006, who also gives a date of 1988 in square brackets. Spencer died in 1999)

Spencer, F. (revised by **M. Pottle**) 2004. Dawson, Charles (1864–1916). In: *Oxford dictionary of national biography*. Oxford: University Press, vol. 15, 550–551. (Here described as 'palaeontologist and antiquary', born on 11 July 1864 at Fulkeith Hall, Lancashire, the second of four children (he had two brothers and a sister). By 1873 his father had moved to St Leonards, Sussex. From 1890 until his death, Charles practised as a solicitor in Uckfield. 'Tall, moustachioed, and prematurely bald, Dawson appeared older than his years and as a long-serving clerk to the magistrates he was an important figure in the life of the town.' In 1903 he bought Castle Lodge, Lewes, and on 21 Jan 1905 he married Hélène Léonie Elizabeth Postlethwaite (1859–1917), a widow with two grown children. There were no children from this marriage. With regard to the Piltdown fraud Spencer's views had evidently not changed, for he concludes that 'Though Dawson may not have masterminded this sophisticated and influential forgery, his complicity in the affair was strongly suspected.' Late in 1915, in a letter to A. S. Woodward, Dawson reported that he was ailing from an 'anaemic condition'. He was given serum injections to counteract this, but developed septicaemia and died on 10 Aug 1916 at Castle Lodge. His wealth at the time of his death is recorded as £3025 14s. 7d. For an account of his more successful brother, Trevor, who may have shared some family traits, see Davenport-Hines 2004.)

Spencer, F. & Stringer, C. 1989. Radiocarbon dates from the Oxford AMS system: Piltdown. *Archaeometry*, **31** (2), 210. (Report on accelerator mass spectrometry radiocarbon (AM RC) dating on the Piltdown jaw and on a fragment of the Piltdown II skull. The date range derived for the jaw (orangutan) is at variance with the earlier date range of De Vries & Oakley 1959, being much younger than was then thought. When calibrated to calendar years the date for the Piltdown II skull fragment equates to AD 750–1300, while the most likely date for the jaw lies within the range AD 1630 to the present. Information derived from Craddock 2009.)

Spencer, F. (for obituary see Tobias 1999a, 1999b)

Spurrell, H. G. F. 1917. *Modern man and his forerunners: a short study of the human species living and extinct*. London: G. Bell & Sons, x, 192 pp. (*Eoanthropus*, p. 44, plate V. Cited in Quenstedt 1936)

Squire, J. 1955. One of the world's most amazing hoaxes: "The Piltdown Forgery", by J. S. Weiner: an appreciation. *Illustrated London News*, 19 Mar, 498. (Whereas Weiner concluded that the question of Dawson's guilt must remain open, the present writer does not think 'that any jury in England would fail to return, in five minutes, a verdict against Dawson... Dawson, like Hitler and many another man, wanted Fame... He wanted to be acknowledged as a great discoverer, a man who excelled the specialists. Alas for him: very shortly after the news of his find had astonished the scientific world, the Great War broke out... then he died, at a time when nobody could bother much about him or his revelation. But suppose that he had lived until after the war? His discovery was still accepted, and for long afterwards. Surely he would have

become at least Sir Charles Dawson, O.M., F.R.S., or even Lord Dawson of Piltdown... His fame, nevertheless, is established. So also is that of his Missing Link. At Piltdown there is an inn which carries an impressive sign of the "Piltdown Man": a formidable, hairy, crouching creature... I hope they won't take the sign down.')

Steel, R. E. 1926. The Palaeolithic drawing of a horse from Sherborne, Dorset. *Nature*, **117** (6 Mar), 341–342. (A response to Bayzland 1926, in which the correspondent, who was the science master at Sherborne School when the two boys, A. Cortesi and P. C. Groves, reputedly found the engraved bone, provides an account of the circumstances surrounding the 'discovery'. Appended to his letter is another from E. A. Ross Jefferson, a contemporary of Cortesi, who vouches for its genuineness.)

Steer, F. W. 1974. Ask the Piltdown Man. *The Times*, 2 Apr, 15. (A response to Howard 1974 concerning the fake Maresfield Forge map exposed by P. B. S. Andrews. Francis W. Steer was at this time President of the Sussex Archaeological Society, and his letter is largely a defence of the Society's integrity. He expresses the hope that the editor of the Society's *Collections* will publish Andrews' finding in full. This duly appeared as Andrews 1974. The letter prompted a jaundiced reaction from Alfred Scheuer 1974a)

Stocking, G. W. Jnr. 1992. Book review: [Spencer 1990]. *Isis*, **83**, 347–349. (Cited in Turrittin 2006)

Stopford, J. S. B. (see under Dawson, W. R. 1938)

Strahan, A. 1912. [Interview on the Piltdown discovery]. *Manchester Guardian*, 19 Dec. (Aubrey Strahan was Director of the Geological Survey of Great Britain and President of the Geological Society of London in 1912. In this latter capacity he presided over the meeting on 18 December at which Dawson and Woodward presented *Eoanthropus dawsoni* to the public for the first time. Spencer 1990a, 55–6, provides the following information based on an interview that Strahan gave to the *Manchester Guardian*: 'Aubrey Strahan told the *Manchester Guardian* that he was convinced of the "extreme antiquity" of the Piltdown site, stating that he had examined it at firsthand. The geology of the Piltdown gravels, he said, were complex, and not wholly synonymous with the situation found in the Thames river valley... He also stated that not only had there been no general geological survey of the region for many years, it was also likely that there would not be one for some time; a fact that must have disturbed him, since the controversy of the skull's antiquity turned on the question of whether it was "buried originally in the stratum in which it was found or whether it had been washed out of some still earlier geological formation into that stratum". If the former supposition was true... then the remains must be of Pleistocene age, as Dawson and Woodward had supposed. But in the latter case ... it might well be a relic of the Pliocene or of an even earlier age.' Strahan had visited the Piltdown site in the company of Dawson on 10 December: Spencer 1990b, 36–7. With respect to official geological mapping in the area see under Geological Survey of Great Britain.)

Strahan, A. (see also Anon. 1914a: meeting on the eolithic controversy)

Straker, E. 1931. *Wealden iron: a monograph on the former ironworks in the counties of Sussex, Surrey and Kent*. London: G. Bell & Sons, xiv, 487 pp, plates. (In discussing the former cinderheaps of the Roman bloomery site at Beauport Park, near Battle, pp. 330–337, the writer concludes with respect to the cast iron statuette acquired by Charles Dawson, that 'Notwithstanding Mr. Dawson's belief in the authenticity of this find, there are some doubts on the matter. The sale of the objects found was a valuable source of income to the diggers, and it is possible that deception may have been practised. From the context it is evident that similar bronze figures have been produced, and a replica in modern cast iron would not be difficult to cast and to corrode by burial' (p. 337). In discussing the Maresfield powder mills, pp. 400–403, he alludes to the 'curious map of 1724, copied by the late C. Dawson' (Maresfield Forge map), but, apart from reproducing the map, has little to say about it (p. 401). Reference is made to the Ashburnham clock dial preserved in the museum of the Sussex Archaeological Society at Lewes, pp. 75–77. The writer appears to accept this as genuine and includes both a photograph, taken from Arthur Hayden's *Chats on cottage and farmhouse furniture*, and a carefully made drawing by W. A. Young: see Combridge 1977a–b for background.)

Straus, W. L., Jnr. 1954a. The great Piltdown hoax. *Science*, **119** (26 Feb), 265–269; reprinted in *Annual Report of the Smithsonian Institution*, 1955, for 1954, 363–371. (In an aerogramme to K. P. Oakley, dated 21 Nov 1953, William L. Strauss, then President of the American Association of Physical Anthropologists, had sent his congratulation 'on solving this riddle that has plagued our science for so many years...' and admitted to being 'one of those who refused to accept the association of cranium and jaw...': Spencer 1990b, 206.)

Straus, W. L., Jnr. 1954b. Science news. *Science*, **120** (3 Sep), 366–367. (Including a discussion of the Piltdown forgery. Cited in Turrittin 2006)

Stringer, C. B. 1990a. The Piltdown con man. *Guardian*, 22 June, 28. (Concerns Spencer's forthcoming book which implicates Arthur Keith in the Piltdown forgery. The writer considers that Langham and Spencer have assembled the best case yet made for the prime perpetrator of the Piltdown forgery.)

Stringer, C. B. 1990b. Piltdown forgery. *The Times*, 28 June, 13. (A short response to Levin 1990, in which Chris Stringer, representing the Natural History Museum, appears to support, or at any rate does not oppose, the Langham/Spencer case against Sir Arthur Keith. Spencer's book (Spencer 1990a), which appeared in October of that year, was published jointly by the NHM and Oxford University Press.)

Stringer, C. B. 1992 (contribution to discussion in Tobias 1992c: the writer still believes that the Langham/Spencer/Tobias case is the best yet made for the prime perpetrator of the Piltdown forgery. Dawson however is 'implicated even more strongly, particularly by the fact that my research supports suspicions that the Piltdown II molar is almost certainly from the left side of the original Piltdown I jaw. However, the fact that the Piltdown mandible is smaller than any mature orang jaw in the Natural History Museum collections suggests that it was specially selected from an extensive collection not likely to be available to an amateur like Dawson but certainly available to a museum curator such as Keith.' The canine clearly disturbed Keith, and is a rather inferior forgery. Stringer thinks 'that the distinctiveness of the canine tooth points to yet another forger, one who could only replicate the chemical staining of the other Piltdown specimens by the use of oil paint!' Tobias, in his reply p. 280, points out that Hrdlička (1930, 87) had already reached the same conclusion as Stringer, that the Piltdown II molar is most likely from the left side of the Piltdown I jaw.)

Stringer, C. B. 2000. Gibraltar and the Neanderthals 1848–1998. In: *Neanderthals on the edge: papers from a conference marking the 150th anniversary of the Forbes' Quarry discovery, Gibraltar* / edited by C. B. Stringer, R. N. E. Barton & J. C. Finlayson. Oxford: Oxbow Books, pp. 133–137.

Stringer, C. B. 2003a. Afterword: Piltdown 2003. In: *The Piltdown forgery* / J. S. Weiner, fiftieth anniversary edition, with a new introduction and afterword by Chris Stringer. Oxford: University Press, pp. 188–201. (After presenting an overview of developments in the 'ever-growing list of suspects behind the debacle', the writer concludes that 'In my opinion there is now even more evidence to support Weiner's suspicions that Dawson was heavily, and perhaps solely, implicated in the Piltdown hoax. He was the only figure present throughout the main events, and the bizarre 'discoveries' at Piltdown II can only be laid at his door. Although radiocarbon dating did not establish that any cranial parts were in common between Piltdown I and II, my comparison of the molar teeth from both sites supported the supposition that they are from the same mandible. Hence, whoever produced the Piltdown II finds had access to the rest of the jaw that appeared at Piltdown I, and had treated the new find in identical fashion... For me, the mysteries that remain are whether Dawson had the knowledge and materials to have acted alone, and whether others were involved independently of him, and here perhaps the name of Martin Hinton, at least, stays in the frame for further investigation.' See also Henderson 2003.)

Stringer, C. B. 2003. Piltdown 2003. *Set in Stone*, 1 (4), 1–3. (Not seen)

Stringer, C. B. 2004a. Fake! *British Archaeology*, no. 74 (Jan), 13. (Edited extract from Stringer 2003a)

Stringer, C. B. 2004b (see Taggart 2004)

Stringer, C. B. 2004c. Piltdown – the final answers? In: *Geofakes, frauds and hoaxes*, abstracts of a meeting organised by the History of Geology Group, under the aegis of the Geological Society of London, Burlington House, London, 22 October 2004, p. 6. ('At least 25 men have since been accused of being involved in the [Piltdown] forgery, but Dawson has always been the prime candidate, and further evidence against him has continued to emerge. Recently, however, an alternative has come to the fore' [i.e. Hinton])

Stringer, C. B. 2006. *Homo britannicus: the incredible story of human life in Britain*. London: Penguin Books, 242 pp. (Believes that the Piltdown 'cricket-bat' was planted by Martin Hinton as a warning to Dawson that someone was onto him, pp. 30–34. This seems to reflect the 'official' view from the Natural History Museum, of which Hinton was an employee. Such a view fails to explain why Hinton should have taken the trouble to authenticate the bone by covering it in sticky yellow clay from the bottom of the pit, and to have gone to the unnecessary length of planting smaller fragments of the same bone into the *in situ* clay.)

Stringer, C. B. 2012. The 100-year mystery of Piltdown Man. *Nature*, 492 (13 Dec), 177–179. (A team of 15 researchers from the Natural History Museum and several British universities are now examining the Piltdown finds using techniques such as radiocarbon dating and DNA and isotope studies in order to pin down the taxonomic identities and geographical origins of the specimens. Spectroscopy will be used to establish how many different staining methods were applied to the Piltdown assemblages of bones, teeth and tools.)

Stringer, C. B., d'Errico, F., Williams, C. T., Housley, R. & Hedges, R. 1995. Solution for the Sherborne problem. *Nature*, **378**, 452. (Letter describing the results of a detailed analysis of a supposed Palaeolithic engraving of a horse's head on a mammalian rib, said to have been discovered in quarry debris at Sherborne, Dorset, and described by A. S. Woodward 1914. The engraving is shown to be a recent fake. See also report by Nigel Hawkes, 'Prized Stone Age carving exposed as juvenile hoax', *The Times*, 30 Nov 1995, p. 8. For other references to the Sherborne engraving see herein, and Turrittin 2006, 12.)

Stringer, C. B. (see also under Spencer)

Sussman, R. W. 2000. Piltdown Man: the father of American primatology. In: *Primate encounters: models of science, gender, and society* / edited by S. C. Strum & L. M. Fedigan. Chicago: University of Chicago Press, pp. 85–103. (Not seen)

Sutcliffe, W. H. 1913. A criticism of some modern tendencies in prehistoric anthropology. *Memoir and Proceedings of the Manchester Literary and Philosophical Society*, **57** (7), 1–25, plates 1–2. (Piltdown man, p. 3. Considers skull and jaw as 'undoubtedly belonging to the same individual.' He places *Eoanthropus* on the line leading to *Homo sapiens*, plate 1. He dismisses eoliths as the result of natural agencies. From Miller 1915. Spencer 1990a (82, 219 n. 6) notes that both Boyd Dawkins and Elliot Smith made frequent reference to Sutcliffe's arguments against eoliths and rostro-carinates in their respective public denunciations of the Piltdown eolithic 'artefacts'.)

Swinnerton, H. H. 1954. [Personal recollection of Dawson & Woodward's presentations of the Piltdown finds at the Geological Society on 18 Dec 1912 and 2 Dec 1914]. In: Spencer 1990b, 245–246. (Henry H. Swinnerton was professor of geology at University College Nottingham from 1910 to 1946.)

Swinton, W. E. 1976. Physician contributions to nonmedical science: Sir Grafton Elliot Smith and Piltdown Man. *Canadian Medical Association Journal*, **115** (20 Nov), 1047–1053. (Not seen)

Symington, J. 1915. On the relations of the inner surface of the cranium to the cranial aspect of the brain. *Edinburgh Medical Journal*, **14** (Feb), 85–100. (Johnson Symington held the Chair of Anatomy at Queen's College, Belfast. He clashed on several occasions with Elliott Smith over the latter's interpretation of the endocranial cast of the Piltdown skull: see Spencer 1990b, 112, 113, 141, and Symington 1916.)

Symington, J. 1916. Endocranial casts and brain form: a criticism of some recent speculations. *Journal of Anatomy and Physiology*, **50** (3), 111–130. (The author strongly disagrees with Elliott Smith's interpretation of the Piltdown braincase and sees no peculiarity of development in the endocranial cast that would distinguish *Eoanthropus* from a modern human, pp. 122–129. See also remarks by Wright, W. 1916b.)

Taggart, F. 2004. Missing link in Piltdown scam named. *The Argus*, 20 Jan, 18–19. ('In a public lecture given at the Natural History Museum, Professor Chris Stringer and Mr Currant named the man they believe was responsible – Charles Dawson... Mr Currant added: "The essence of our feelings about the hoax now is that Charles Dawson was the prime and probably the sole mover behind everything that happened at Piltdown, with the exception of the manufacture and planting of the "cricket bat"... This object is so absurd that whoever planted it must have believed it would blow the hoax wide open, but Dawson and his friend Arthur Smith Woodward... went ahead and published it as a genuine example of worked bone. Providing Woodward didn't have reservations about this find – and it would appear that he didn't – Dawson would have had no option but to go ahead and report its discovery, but the finding of this piece marked a fundamental change in the nature of events." Currant argues that Dawson's report of further hominid fragments from an undisclosed location and the lack of further discoveries at Barkham Manor was his reaction to someone trying to expose him. 'There have been several scandals involving fossil fraud, which has become a lucrative business. The museum regularly gets visitors with supposed *Homo erectus* skulls they have bought from a trader in Java, which turn out to be carved out of fossil elephant bones.' On this last point see Shipman 1992.)

Tait, S. 1990. Lost science jobs fuel fears over museums' future. *The Times*, 3 Oct, 7. (The article includes a picture of Frank Spencer holding up a model of the Piltdown skull, with the following caption: 'Face to fake: Frank Spencer, the anthropologist who has identified the anatomist Sir Arthur Keith as a new suspect in the Piltdown Man forgery, looks at a model of the skull found in 1912. Dr Spencer's claims, based on findings in the archives of the Natural History Museum and the Royal College of Surgeons, were published yesterday'.)

Tappen, N. C. 1953. A mechanistic theory of human evolution. *American Anthropologist*, **55**, 605–607. (In the light of Oakley's application of relative fluorine dating of the Piltdown finds, which showed them to be much younger than originally thought, the writer concluded 'that there was something wrong with the finds,

and I felt safe in ignoring Piltdown in [this] theoretical overview of major processes of human evolution.' From Tappen 1992.)

Tappen, N. C. 1992 (contribution to discussion in Tobias 1992c: the writer is uncomfortable with the notion of accepting the certainty of Keith's guilt in the Piltdown affair. 'If he was the perpetrator of the fraud, it seems to me that he was short-term cunning but long-term stupid, because the various forgeries were in the public domain and were bound to be exposed sooner or later, even if he wasn't. And the manipulations were quite crude, in my opinion, even for those early days. I agree with Langdon that the interested amateur could have done the work, despite Tobias's admiration for the breadth of knowledge demonstrated, and I believe that the major or sole perpetrator was Dawson. Subsequent management of the Piltdown materials probably contributed to the delay in exposing the fraud... I have reason to believe that access to the fossils and artifacts for further study was severely restricted for many years. According to Theya Molleson (personal communication), exposure of the fraud led Oakley to establish a policy that allowed any reasonably qualified person to study the important fossils held at the British Museum (Natural History), a substantial gain for anthropology. I was one of the beneficiaries of this policy, and it may be that other European museums that cooperated generously with me were influenced by the Piltdown experience to allow outside investigators with reasonable projects free access to their holdings.'))

Tattersall, I. 1995. *The fossil trail: how we know what we think we know about human evolution*. New York: Oxford University Press, 276 pp. (An examination of how fossil human finds have been interpreted and misinterpreted through time. 'Tattersall looks at all these great researchers and discoveries within the context of their social and scientific milieu, to reveal the insidious ways that received wisdom can shape how we interpret fossil findings, and how what we expect to find colors our understanding of what we do find.' Turritin 2006 cites pp. 48–51, 96–97.)

Taylor, R. M. S. 1937. The dentition of the Piltdown fossil man (*Eoanthropus dawsoni*) from a new aspect. *Report Australian and New Zealand Association for the Advancement of Science*, **23**, 201, 245. (Title only; for the text of this paper see Taylor 1978)

Taylor, R. M. S. 1978. *Variation in morphology of teeth: anthropologic and forensic aspects*. Springfield, Illinois: Charles C. Thomas, xxiii, 384 pp. (The text of a paper originally written in 1937, on the dentition of Piltdown Man, is here included as an appendix, pp. 362–370. The author demonstrates that Smith Woodward's reconstruction of the Piltdown skull would not have functioned as a normally operating masticatory structure.)

Taylor, R. M. S. 1980. Piltdown echoes again. *New Zealand Archaeology Association Newsletter*, **23** (4), 232–234. (Cited in Turritin 2006)

Teilhard de Chardin, P. 1913. La préhistoire et ses progrès. *Etudes* (Peres de la Compagnie de Jésus, Paris), nr. 134, 40–53. For English translation see: Teilhard de Chardin, P. 1956. *The appearance of man* / translated by J. M. Cohen. New York: Harper & Row. (Francis Thackeray has argued that a sentence in this essay, which appeared in Jan 1913 a few weeks after the formal announcement of the discoveries at Piltdown, constitutes an admission of guilt by Teilhard. The opening sentence states: *I' fut un temps ou la préhistoire méritait d'être suspectée ou plaisantée* (There was a time when the study of prehistory deserved to be suspected or joked about). Thackeray's translation (after J. M. Cohen) makes the final part of this statement read '... the subject of jokes', which he takes to be an admission by Teilhard that English palaeontologists, including Smith Woodward, had been taken in by a joke (perpetrated by Teilhard). On the other hand, it may simply have been Teilhard's way of saying that the subject of man's prehistory had previously not been taken seriously but had now finally come of age thanks to the efforts of people like Hugo Obermaier and Marcellin Boule, both of whom taught at the Institut de Paléontologie Humaine in Paris, where Teilhard was then studying. Obermaier was about to publish his *Der Mensch der Vorzeit*, while Boule was due to complete the publication of a series of erudite monographs (1911–March 1913) describing the first complete Neanderthal skeleton from La Chapelle-aux-Saints. Thus Teilhard's remark may have had no relevance to the discoveries at Piltdown.)

Teilhard de Chardin, P. 1920. Le cas de l'homme de Piltdown. *Revue des questions scientifiques*, **77**, 149–155. (This paper presents Teilhard's only published statement on Piltdown. He regards the skull as being older than Neanderthal but essentially that of an advanced human, whereas the jaw belongs to a fossil ape, and thus he supposes that the skull and jaw must belong to two different creatures.)

Teilhard de Chardin, P. 1952. On the zoological position and the evolutionary significance of Australopithecines. *Transactions of the New York Academy of Sciences*, **14** (5), 208–210. (After 1920,

Teilhard for the most part ignored the evidence of Piltdown in his discussion of fossil man. Interestingly, he chooses in this paper to represent *Eoanthropus* on an evolutionary diagram (Fig. 1) as Middle Pleistocene in age, and on the direct line to *Homo sapiens*, but goes no further than this notation. In this respect, he was clearly discounting the jaw in his assessment of *Eoanthropus*.)

Teilhard de Chardin, P. 1965. *Lettres d'Hastings et de Paris, 1908–1914*. Paris: Aubier éditeur, 463 pp. (Letters to his parents written during his time in the seminary at Hastings, and touching on his activities at Piltdown. A translation of some of these letters into English was published by Herder & Herder, New York, 1967 and 1968. See also translated correspondence in Spencer 1990b, and Schmitz-Moormann 1981b.)

Teilhard de Chardin, P. 1967. *Letters from Paris, 1912–1914*. New York: Herder and Herder, 157 pp. Translated by Michael Mazzaresse. (See in particular pp. 93, 95, 98–99, 104–105. Not seen.)

Teilhard de Chardin, P. 1968. *Letters from Hastings, 1908–1912*. New York: Herder and Herder, 206 pp. Translated by Judith de Stefano. (For reference to meetings with Dawson see e.g. pp. 47–48, 53, 58, 190, 198; for his return to France in July 1912 see pp. 205–6. Not seen.)

Teilhard de Chardin, P. (for Teilhard's views immediately following the first announcement of the Piltdown forgery, see Anon. 1953e, and correspondence in Spencer 1990b. For biographical information see e.g. Lukas & Lukas 1977, Speaight 1967. For a discussion of Teilhard as a suspect see Turriffin 2006, 25–28.)

Thacker, A. G. 1913a (see Buttel-Reepen 1913)

Thacker, A. G. 1913b. The significance of the Piltdown discovery. *Science Progress*, **8**, no. 30, 275–290.

Thacker, A. G. 1916. [Note on Miller 1915]. *Science Progress*, **10**, 468. (Not seen)

Thackeray, J. F. 1992. On the Piltdown joker and accomplice: a French connection? *Current Anthropology*, **33** (5), 587–589. (A response to Tobias's defence of Teilhard de Chardin, *ibid*, **33**, 244)

Thackeray, J. F. 2011. On Piltdown: the possible roles of Teilhard de Chardin, Martin Hinton and Charles Dawson. *Transactions of the Royal Society of South Africa*, **66** (1), 9–13. (A scenario is presented in which Martin Hinton, wishing to play a joke on Smith Woodward, asks Teilhard for help in August 1913; thus on 30 Aug Teilhard 'discovers' the canine in an area that had already been searched. It is suggested that both Hinton and Teilhard wanted the Piltdown joke to be exposed after it had attracted so much attention following the formal announcement in Dec 1912. The canine, which had been crudely painted, was supposed to have alerted Woodward to the joke, but he accepted it as genuine. Dawson also may not have been entirely innocent, although his possible role is not explained. The bone 'implement' is not discussed.)

Thackeray, J. F. 2012. Deceiver, joker or innocent ? Teilhard de Chardin and Piltdown Man. *Antiquity*, **86**, 228–234. (With regard to the author's principal argument see comments under Teilhard de Chardin 1913. Reference is made at the end of this paper to Teilhard having purportedly deposited a letter in a bank with instructions that it was not to be opened until all the people concerned were dead. It is inferred that the letter might have shed some light on Piltdown. Thackeray has informed this Compiler that Teilhard's bank details are said by the Wenner Gren Foundation to have been destroyed following his death, at which time also his documents were removed from his WG office, where he was President at the time, by Jesuits.)

Thieme, F. P. 1986. Stephen Jay Gould, Pierre Teilhard de Chardin and Piltdown revisited. *American Journal of Physical Anthropology*, **69** (2), 271. (Abstract of paper to be presented at the 55th annual meeting of the American Association of Physical Anthropologists, Albuquerque, New Mexico...April 9–12, 1986)

Thieme, F. P. 1988. Book review: [Blinderman, *The Piltdown Inquest*]. *American Anthropologist*, **90**, 170–171. (Cited in Turriffin 2006)

Thomas, H. 2002. *Le mystère de l'homme de Piltdown: une extraordinaire imposture scientifique*. Paris: Belin, 288 pp. (Provides what has been described as perhaps the most objective analysis of the Piltdown affair. Separate chapters are devoted to Teilhard de Chardin, Sir Arthur Keith, and Sir Arthur Conan Doyle. The following remarks are from Turriffin 2006, 17: 'Thomas discussed both the history of the Piltdown discoveries and the forger's identity, stressing that little about the latter could be proven due to the incomplete historical record. He concluded by neither accusing nor absolving Dawson, although he felt that Dawson probably knew something of the truth before he died.' This last remark rather suggests that Thomas absolves Dawson of guilt!)

Thomas, H. 2003. «Tête» d'imposteur ! *Historia*, no. 675, 38–41.

Thompson, L. 1986. Qui a fabriqué l'homme de Piltdown? *L'Histoire*, no. 88, 94–96.

Thompson, T. F. 1954. Mr Piltdown exposed again [...] *Daily Mail*, 16 Nov. (Report of an interview with J. Manwaring Baines, Curator of Hastings Museum, who 'has discovered that at least five of the items in the Dawson collection are like the Piltdown skull—faked.' He also finds that Dawson was not the author of his *History of Hastings Castle*. 'In his fanatical desire to become eminent as an antiquarian and historian, Dawson copied an unpublished work.' Baines, who is himself writing a history of Hastings, told the reporter 'A local bookseller phoned me to say he had obtained an unpublished manuscript by William Herbert about the castle. When I examined it I realised within a few minutes that I was reading Dawson's book. The illustrations on these pages were reproduced in Dawson's book. When I compared the two works I found that Dawson had copied practically the lot—even down to Herbert's little jokes.' This discovery, followed by the revelation that the Piltdown skull was a fake, led Baines to examine the museum's own collection of Dawson items. 'One exhibit was a tipstaff, bearing the date 1833, labelled by Dawson as being the "ore mace of the Hastings water bailiff with which he made arrests on the high seas." Mr. Baines found the office of water bailiff was abolished in 1825. And far from having jurisdiction to make arrests on the high seas, the water bailiff's duties had been to keep clean a stream which ran through Hastings.' Mention is also made of the Beauport statuette, but R. L. Downes receives no mention. See also Baines 1954, 1986)

Thomson, K. S. 1991a. Piltdown Man: the great English mystery story. *American Scientist*, **79**, 194–201. (After reviewing the evidence in the Piltdown affair, the writer finds himself favourably inclined to the 'devilishly ingenious scheme' put forward in 1980 by Leonard Harrison Matthews, which he thinks explains nearly all of the anomalies and motives, but with a few modifications in order to make it 'the perfect English crime.' Unlike Matthews, he sees Dawson as the sole instigator. Thus, Dawson begins by luring Samuel Woodhead, Lewis Abbott and Teilhard de Chardin into his plot with a cock-and-bull story of workmen finding a coconut-like skull. Having once tempted Smith Woodward onto the site, he realises that more is needed than just a bit of thick cranium. During one of his visits to the Natural History Museum he steals a medieval orangutan jaw to plant at Piltdown after doctoring it to disguise its true affiliation. Martin Hinton, then a temporary worker at the NHM, suspects fraud, but cannot be seen to question the judgement of such pompous advocates as Woodward and Arthur Keith. He drops hints to the visiting American vertebrate palaeontologist, William King Gregory, who goes on to publish these 'suspicions'. Yet Woodward is undeterred, so Hinton decides to let the forger know he has been detected by playing a practical joke. He starts with a patently false canine, planted by Teilhard in revenge for having been duped by Dawson (three different scenarios are presented for Teilhard's involvement). This not having the desired effect, Hinton decides to provide Woodward's 'First Englishman' with a suitable accoutrement in the shape of a bone cricket bat, but the joke flops again. Dawson strikes back with Piltdown II, and then leaves Hinton and Teilhard in limbo by dying! They have no choice but to lie low and drop a few hints. Thomson's article, which presumably was not meant to be taken seriously, was evidently prompted by the publication of Spencer 1990a and produced a response from Spencer 1991; see Thomson 1991b.)

Thomson, K. S. 1991b. Piltdown remains. *American Scientist*, **79**, 388. (Reply to Spencer 1991)

Thomson, K. S. 1993. Piltdown Man, the great English mystery story. In: *The common but less frequent loon and other essays* / edited by K. S. Thomson. New Haven: Yale University Press, pp. 82–95, 175–176. (Essentially the same text as Thomson 1991a)

Thorne, J. 1954. Charles Dawson. *The Times*, 19 Nov, 9. (A response to the interview with Baines 1954. The correspondent, who is Chairman of the Battle and District Historical Society, points out that some injustice has been done to Dawson concerning the alleged plagiarism in his *History of Hastings Castle*. 'It is scarcely correct to say that Dawson in his preface gives only five lines to William Herbert's work. He writes of Herbert in two passages—in the first (strangely enough, if he himself was a plagiarist) he says that in 1824 Herbert "wrote the letterpress of Moss's History of Hastings, but without acknowledgement by the ostensible writer." In the second—a passage not of five lines but of half a page—he describes Herbert's "invaluable" and "magnificent record" at some length and in terms which (if he himself was not a plagiarist) would be regarded as generous.'

Thornton, J. 1990. Making monkeys out of evolutionists. *The New American*, **6** (17 Dec), 35–38.

Thuillier, P. 1972. Une supercherie exemplaire: l'homme de Piltdown. *La Recherche*, **3**, nr 28, Nov, 998–1002. (A review of Esbroeck 1972 and Millar 1972. Cited in Turrin 2006)

Tilney, F. 1927. The brain of prehistoric man. *Archives of Neurology and Psychiatry (Chicago)*, **17**, 723–769. (*Eoanthropus*, pp. 738–743. Cited in Quenstedt 1936)

Tilney, F. 1928. *The brain from ape to man: a contribution to the study of the evolution and development of the human brain*. New York: Paul B. Hoeber, 2 vols. (*Eoanthropus*, Vol. II, pp. 738–740, 751–752, 884–893. Cited in Quenstedt 1936)

Tobias, P. V. 1985. The former Taung cave system in the light of contemporary reports and its bearing on the skull's provenance: early deterrents to the acceptance of *Australopithecus*. In: *Hominid evolution: past, present and future* / edited by P. V. Tobias. New York: Alan R. Liss, pp. 25–40. (Argues that Arthur Keith and the belief in Piltdown delayed the acceptance of *Australopithecus* as ancestral to humans by some 28 yrs)

Tobias, P. V. 1990. Introduction to a forgery. In: Spencer 1990a, pp. vii–xii.

Tobias, P. V. 1991. The Piltdown skull forgery and Taung: rejection and acceptance in science, and new revelations on the identity of the forger, part I. *Adler Museum Bulletin*, **17** (3), 4–14.

Tobias, P. V. 1992a. New researches at Sterkfontein and Taung with a note on Piltdown and its relevance to the history of palaeo-anthropology. *Transactions of the Royal Society of South Africa*, **48** (1), 1–14.

Tobias, P. V. 1992b. The Piltdown skull forgery and Taung: rejection and acceptance in science, and new revelations on the identity of the forger, part II. *Adler Museum Bulletin*, **18** (1), 9–26. (See reactions from Dommissie 1992 & Hirschson 1992, and reply from Tobias 1992d)

Tobias, P. V. 1992c. Piltdown: an appraisal of the case against Sir Arthur Keith. *Current Anthropology*, **33** (June), 243–293 (with discuss). (Sets forth a detailed, if unsound case against Keith as co-conspirator with Dawson in the Piltdown forgery. Tobias's views on Keith originated from a conversation with Ian Langham in 1984. The 'nine pointers to Keith's guilt' contains errors, omissions of fact, and strangely one-sided interpretations. One cannot help but agree with the assessment of Walsh 1996, that 'Here, surely, is the ultimate illustration of how far from reality, from common sense, the Piltdown investigation has drifted, how far it now stands from any clear idea of what constitutes actual evidence.' Tobias's agenda, it has been said, is driven by his admiration for Raymond Dart, discoverer of *Australopithecus* (the Taung skull), which he believes was rejected by Keith as a human ancestor because it contradicted the evidence of Piltdown. Interesting insights are provided into Keith's character which show that, like some other key figures in the Piltdown affair, he was driven by excessive ambition. An important element in Tobias's defence of Teilhard de Chardin, whose supposed complicity had been much discussed over the preceding decade (e.g. Gould), rests on his argument (first noted by Spencer 1990a, 186) that Teilhard had probably been taken by Dawson to the site of Piltdown III (Barcombe Mills) in 1913, and not Piltdown II (Sheffield Park) as both Teilhard and his accusers believed; however, some of Tobias's statements in this respect are misleading, and a clearer presentation of the evidence will be found in Walsh (1996, 136–9, 240–1, n. 137). The discussion that followed this paper incorporated comments from: P. J. Bowler, 260–1; A. T. Chamberlain, 261–2; C. Chippindale, 262; R. W. Dennell, 263; F. G. Fedele, 263–4; P. Graves, 264–5; C. Grigson, 265–6; G. A. Harrison, 266–7; F. B. Harrold, 267–8; K. A. R. Kennedy, 268–9; M. K. Nickels, 269–70; N. Rolland, 270–1; C. Runnels, 271–2; F. Spencer, 272–3; C. B. Stringer, 273; N. C. Tappen, 273–4; B. G. Trigger, 274–5; S. Washburn, 275–6; R. V. S. Wright, 276–7. See under these author's names for further commentary in what proved to be a most fruitful discussion. There follows a lengthy reply from Tobias, 277–93. There was also a response from Munizaga 1993. In respect of Tobias's defence of Teilhard, see reactions from Clermont 1992, & Thackeray 1992. See Turrington 2006, 24, for a discussion of Tobias's presentation.)

Tobias, P. V. 1992d. The case against Keith re-visited: reply to two critics. *Adler Museum Bulletin*, **18** (2), 26–28. (A reply to Dommissie 1992 and Hirschson 1992)

Tobias, P. V. 1993. On Piltdown: the French connection revisited. *Current Anthropology*, **34**, 65–67. (A response to criticisms from Clermont 1992 and Thackeray 1992 in respect of Tobias's defence of Teilhard)

Tobias, P. V. 1994. Piltdown unmasked. *The Sciences*, **34** (Jan/Feb), 38–42. (A much condensed version of Tobias 1992c which appears not to have taken on board the criticisms made in the invited discussion that followed his 1992 paper. It drew a response from Paula E. Drew, which was published with Tobias's reply under the heading: 'Eighty-one years without a punch line', *The Sciences*, **34** (May/June), 6–7. Drew has nothing of substance to say and assumes (jokingly?) that the Piltdown remains were stained by steeping them in strong tea, to which Tobias replies 'although the idea tickles the taste buds, it was not tea that the salted specimens were steeped in, but potassium bichromate and in one instance Bismarck brown [*sic*]. Those are not ingredients of any of the fifty-seven varieties of tea in my kitchen.'

Tobias, P. V. 1999a. Frank Spencer: quiet anthropologist whose detective work cracked the hoax of Piltdown man. *Guardian*, 6 July, 20. (Obit: born 1 May 1941, died 30 May 1999. 'The fame of the scholarly, bookish Frank Spencer, who has died of cancer aged 58, rests on the case he made that Sir Arthur Keith was the likely co-conspirator, with Charles Dawson, in one of the most notorious frauds in the history of science, the infamous Piltdown hoax.' So says Phillip V. Tobias, who confines his obituary to an examination of this single theme in Spencer's life, reflecting as it does Tobias's own anti-Keith agenda.)

Tobias, P. V. 1999b. Frank Spencer (1941–1999), historian of physical anthropology and sleuth of Piltdown. *American Journal of Physical Anthropology*, **110** (4), 393–398. ('His was the mental set that discerns what E. M. Forster might have had in mind when, in *A Passage to India*, he wrote, "Only connect!" Few scholars in anthropology have been better versed in the art and science of connecting than Spencer, whose probing of diary entries, past memories, letters, and seemingly casual visits, yielded to him vital clues to the mindset of the protagonists and the sequence of events in the chronicle of a discovery.' Yet making 'connections' can be a hazardous business if zealous enthusiasm gets the better of calm and critical judgement—you can find ley lines in any landscape if you look hard enough.)

Tobias, P. V. 2001. Conversion in palaeo-anthropology: the role of Robert Broom, Sterkfontein and other factors in australopithecine acceptance. In: *Humanity from African naissance to coming millennia* / edited by P. V. Tobias, M. A. Rath, J. Moggi-Cecchi & G. A. Doyle. Firenze: Firenze University Press, pp. 13–31.

Tobias, P. V. & Kennedy, K. A. R. 1993. On Arthur Keith's cover: in other words. *Current Anthropology*, **34**, 67–68. (Following from a statement by Kennedy 1992 and Tobias's reply regarding the embossed depiction of the Piltdown fragments superimposed on the outline of a modern skull which adorns the front cover of Arthur Keith's *Antiquity of Man*, it now transpires that the first impression of the first edition of the work, issued in Oct 1915, has the words 'Piltdown Skull' printed beside the figure, whereas in the second impression of Dec 1915, the third of Feb 1916, the fourth of Mar 1920, and the second edition of Jan 1925, the words appear as 'Piltdown Fragments.' Neither writer seems aware that the depiction reappears as Fig. 98 in the text of the first edition.)

Toldt, C. 1915. Über den vorderen Abschnitt des menschlichen Unterkiefers mit Rücksicht auf dessen anthropologische Bedeutung. *Mitteilungen der Anthropologischen Gesellschaft in Wien*, **45**, 236–267. (Remarks on Piltdown Man, pp. 248–249, 266. The author considers the skull and jaw to be incompatible. The anterior part of the Piltdown mandible is too apelike in character, compared with either Heidelberg or Neanderthal, whereas the cranium is essentially human. Toldt commented on Piltdown in two earlier papers in 1914, which are cited in Quenstedt 1936, 153, 192.)

Toombs, H. A. 1952. A new section in the Piltdown gravel. *South-Eastern Naturalist and Antiquary*, **57**, 31–33. (A 'witness section' in the Piltdown gravel has been preserved by the Nature Conservancy as a permanent Geological Monument. The new section, which cuts through the old hedge about 2 m from the stone monolith monument, was dug in Sept 1950. The NW end of the witness section encountered an old rubbish-filled trial trench on the opposite side of the hedge [probably dug by Smith Woodward in the years after Dawson's death]. This old trial features in a Geological Survey photograph dating from 1925, A2942 (Rhodes 1925a). Although all the material dug from the new trench was sieved and carefully examined by K. P. Oakley, A. E. Rixon and the writer (all of the Natural History Museum), no bones, teeth, or implements were found. The presence of reddened flints and occasional quartz and quartzite pebbles in the gravel was confirmed. None of the reddened flints appeared fire-crackled. The section was then bricked-in, save for a couple of small glass doors, 2ft 3ins by 1ft 3ins, on either side of the trench at its NW end.)

Toppley, W. 1875. *The geology of the Weald (parts of the counties of Kent, Surrey, Sussex, and Hants)*. London: Printed for Her Majesty's Stationary Office, Memoirs of the Geological Survey, England and Wales, 503 pp. (Gravels of the River Ouse, pp. 202–203. 'The gravels of the Ouse are not of any great extent. The most considerable deposits now remaining are, perhaps, those at, and south-west of, Lewes. Passing northwards towards the Weald we find a small patch at Barcombe, which is of interest chiefly from having so long been quoted as a *sea-beach*, produced during the denudation of the Weald [Lyell, *Principles of Geology*, 1st Ed, 1833, vol. iii, p. 296; *Manual*, 5th Ed, 1855, p. 287]. It occurs around the village of Barcombe, and again just north-west of Barcombe Station. It consists of chalk flints and Wealden sandstone, with some other fragments, probably from the Lower Greensand. This is on Weald Clay. There can be no doubt that this is a river gravel: mammalian remains have been found here [Austen 1851]... When we pass northwards, and enter the Hastings Beds country, where the surface is quite free from flints, we cease to find them in the river gravels [thus Dawson's surprise when he encountered flints in the gravel at Barkham Manor]. Here there is nothing but Wealden sandstone. The northerly limit of the flints hereabouts appear to be about the outcrop of the

Hastings Beds.' It may be noted here that Dawson 1903b derived a significant proportion of its content on the history of iron-ore working in the Weald from this Memoir.)

Towler, W. 1953. Fake skull was scientists' odd man out. *Daily Herald*, 23 Nov, 4. (Not seen, but Walsh 1996, 88, states that the feature includes 'an interview with Dawson's nephew and two nieces, children of his brother Trevor. Their admired uncle, they declared, "was not the type of man to hoax anybody...we were proud of our uncle. If anyone suggests he was a party to the hoax we shall certainly do something about it to clear his name."' However, while the newspapers continued to spotlight Dawson as the likely culprit, his family failed to rally, and they were not heard from again in public.' The feature also adds that Trevor had come to London from Scotland 'to consult members of the family' in the matter.)

Townshend, G. L. 1981. Piltdown puzzle. *New Scientist*, **91** (24 Sept), 823. (In response to the series of papers by Harrison Matthews (1981), the writer questions how the Piltdown cranial fragments were radio-carbon dated, given the reported absence of collagen.)

Trevor, J. C. (see under Costello 1986. Jack Trevor, a physical anthropologist at University of Cambridge, wrote to Oakley on 13 Feb 1967 accusing Woodward of being co-conspirator with Dawson, and sent also a rough draft of a communication he evidently planned to publish in *Nature*; see Spencer 1990a, 232 note 78, & Spencer 1990b, 214–15.)

Trigger, B. G. 1992 (contribution to discussion in Tobias 1992c: considers that the evidence against Keith 'remains circumstantial and probably would not win a conviction in a court of law.' There then follows a discussion of the theoretical and philosophical background which supported the interpretation of human evolution embodied by Piltdown. Thus, 'Taung would have had a difficult time being accepted as an ancestral hominid soon after 1924 whether or not the Piltdown fraud had been perpetrated. Nor does it seem that Keith's championing of the Piltdown remains was the sole reason that the advance of palaeoanthropology was held up for a quarter of a century.' He concludes by warning that 'there is little reason to believe that our attempts to understand human evolution are necessarily less myth-ridden today than in the past.')

Turner, C. G. (Clifton George Turner, 1870–1956, was clerk both for the Sussex Archaeological Society, from 1897, and at Charles Dawson's Uckfield office, from 1900. Farrant 2013, 167, has suggested that Turner may have assisted Dawson in acquiring Castle Lodge, by somewhat underhand means. Following Turner's resignation as clerk to the Society, he became Dawson's managing clerk, where we are told that Dawson 'would delight in leading...Cliff Turner up the garden path. After Turner had swallowed the bait Dawson's eyes would twinkle behind his glasses before he gave out a long chuckle' (Farrant 2013, 168). Many years later, having emigrated to Canada, Turner would recall that he 'was present with Sir Charles [sic] when the skull of the prehistoric Pittdown [sic] man was discovered', and 'how he and Sir Charles were caught cleaning the skull bones at the office in the tea kettle that the other clerks used for making tea' (*ibid*). Farrant thus believes that Turner may have witnessed the discovery of the second skull fragment at Barkham Manor in 1911, when there was a court baron, and wonders 'whether Turner had a deeper involvement and was the tall and thin stranger with sallow complexion, in his forties, whom Mabel Kenward disturbed at the Piltdown excavation site.' See Kenward 1955b)

Turner, E. E. 1955. John Theodore Hewitt, 1868–1954. *Biographical Memoirs of Fellows of the Royal Society*, **1**, 79–99, plate. (Hewitt was a prominent chemist, 'a gay, kindly figure', who in 1986 became one of the Piltdown-accused in consequence of something he had said, presumably in jest, a year or so before he died. See Daniel 1986, Costello 1986.)

Turritin, T. H. 2004. Alvan T. Marston: a historical character study. Published on the Web. <http://members.shaw.ca/tom.t/pilt/marston.html> (Focuses on Marston's relationship to Piltdown and attempts to explain his refusal to accept that the Piltdown assemblage was fraudulent or that Dawson, an amateur like himself, was involved in any wrong doing. Marston also wanted the experts to admit that they were wrong in saying that Piltdown Man represented a single creature, and that Dawson had been used by them as a scapegoat to conceal their own errors. There was also an element of self denial—if Piltdown Man's teeth had been artificially altered, it would negate more than 15 years of research into developing a method of distinguishing between the teeth of fossil apes and men, in which Marston had used Piltdown as his main example.)

Turritin, T. H. 2006. An annotated bibliography of the Piltdown Man forgery, 1953–2005. *PalArch's Journal of Archaeology of Northwest Europe*, **1** (1), 1–50. (This bibliography of 752 citations, including an overview and commentary (it is not annotated in the usual sense), focuses on relevant literature written since the exposure of the forgery in 1953. It covers predominantly English and North American material drawn

from academic journals, books, newspapers, magazines, broadcast media and a selection of World Wide Web pages. The bibliography is freely available on the Internet in PDF format. In his 'A Piltdown Man reading list' (Mar 2006, Richard Harter's World), Turriffin expresses his personal conviction that Charles Dawson was the sole perpetrator of the fraud. The reading list is worth consulting as it contains other useful remarks and observations not to be found in the annotated bibliography.)

Underwood, A. S. 1913a. The Piltdown skull. *British Journal of Dental Science*, **56** (1 Oct), 650–652, 3 plates. (Results of X-ray analysis of the Piltdown mandible and teeth. The former exhibits similarities with the jaw of a chimpanzee.)

Underwood, A. S. 1913b (contribution to discussion in Dawson & Woodward 1913b: In response to the concerns expressed by Keith 1913i in connection with the molar teeth in the Piltdown jaw, the speaker stated that 'The two molars were worn down by use, to such an extent that it was impossible that the individual could have been less than 30 years of age, probably a good deal more. The sockets of the third molar were not those of an erupting tooth, the roots had been quite completed...')

Underwood, A. S. 1916. (contribution to discussion in Lyne 1916, 55–56)

Vallois, H. V. 1949. L'origine de l'Homo sapiens. *Compte rendus hebdomadaires des séances de l'Académie des sciences*, **228** (11), 949–951. (Including a discussion of the position of Piltdown and Swanscombe)

Vallois, H. V. 1952. Monophyletism and polyphyletism in man. *South African Journal of Science*, **49**, 69–79. (Not seen)

Vallois, H. V. 1953. La solution de l'énigme de Piltdown. *L'Anthropologie*, **57**, 562–567. (Essentially derived from Weiner *et al.* 1953)

Vallois, H. V. 1954a. Encore la fraude de Piltdown. *L'Anthropologie*, **58**, 353–356.

Vallois, H. V. 1954b. Neandertals and praesapiens. *Journal of the Royal Anthropological Institute*, **84**, 111–130. (Including a discussion of the Piltdown forgery, pp. 122–123)

Vallois, H. V. (see also under Boule 1946, 1957)

Vere, F. [Apr]1955. *The Piltdown fantasy*. London: Cassell & Company, xvii, 120 pp. (Francis Vere, actual name F. Bannister, lived at Piltdown and was well acquainted with Mabel Kenward, formerly of Barkham Manor and still living at Piltdown at the time. His book, published shortly after Weiner's, is a stout defence of Dawson, who he believed had been used as a scapegoat by the scientific establishment. Weiner's insistence that the original cranial fragments were fraudulently introduced along with everything else, in spite of Mabel's recollection to the contrary, was a source of provocation to Vere, and later to Bowden and Booher. Vere's version of events at Piltdown is somewhat naive. He suggests, for example, that one of the diggers hired to work at the Piltdown site, presumably implying Venus Hargreaves, was the forger. See comments by Hillaby 1973, and notes by Turriffin 2006, 29.)

Vere, F. 1959. *Lessons of Piltdown: a study in scientific enthusiasm at Piltdown, Java and Peking*. Stoke, Hayling Island, Hants: The Evolution Protest Movement, 51 pp. (Essentially a restatement of his defence of Dawson against the implied accusations made by Weiner in his book *The Piltdown forgery*. 'The Piltdown case is a complete example of how scientists (a) collect evidence, (b) weigh evidence, (c) argue from evidence.' The circumstances of the original discovery of the Piltdown cranial fragments are discussed at some length. Of Dawson's character Vere states that 'He was the most credulous of men where his hobby was concerned. He would 'twist' and 'nudge' anything to fall in with his preconceptions. He had only to see something to invest it with qualities tending to prove it unique and, if possible, transitional. He did not fake these things. On the contrary, he took and built his crazy theories on them. Given some old gravel, an eolite [eolith] or two (those at the site were genuine) and a piece of bone, and he would create a transitional race of man.' Yet Vere does not believe that Dawson actually did 'create' a transitional race of man! He claims that 'It is not my business to accuse Father Teilhard de Chardin', but goes on to imply very strongly that Teilhard was the forger. Thus: 'What a lucky man was Teilhard! A flint ['palaeolith'] *in situ* and a *stegodon* fragment within two days of beginning inspection in 1912, and the invaluable canine within a few hours of his arrival in 1913! ...The canine did much to strengthen the position of Piltdown Man.' Vere chooses to doubt the evidence of the 'eccentric bank clerk called Harry Morris', because it places his defendant, Dawson, in a bad light! He thus betrays the same bias and preconception of which he accuses the scientific establishment. The final part of Vere's book is an attack on Wilfrid Le Gros Clark's *History of the Primates*, the theory of evolution, and *Pithecanthropus*.)

Vincent, J. B. 1999. Piltdown Man: combining the instruction of scientific ethics and qualitative analysis. *Journal of Chemical Education*, **76** (Nov), 1501–1502. (Not seen)

Vines, G. 2003. Toad in the hole. *New Scientist*, **179** (9 Aug), 50–51. (There have long been stories of toads being found entombed in rock, but the only tangible example surviving in any museum is the famous ‘toad in the hole’ at the Booth Museum, Brighton. This is a mummified toad nestled within a hollow flint, and is one of the museum’s star attractions. Unfortunately this remarkable specimen is tainted by association with the person from whom it was obtained, Charles Dawson. The museum curator, John Cooper, believes that it may be one of Dawson’s frauds.)

Virchow, H. 1916. Zahnbogen und Alveolarbogen. 6. Diluviale Unterkiefer. *Zeitschrift für Ethnologie*, **48**, 289–295. (*Eoanthropus*, pp. 294–295. Cited in Werth 1916, and Quenstedt 1936)

Vogel, J. C. & Waterbolk, H. T. 1964. Groningen radiocarbon dates. *Radiocarbon*, **6**, 368. (A re-analysis of the Piltdown jaw and cranium has reaffirmed the original findings of De Vries & Oakley 1959)

Vram, U. G. 1913. Le ricostruzioni dell’ *Eoanthropus Dawsoni*, Woodward. *Bollettino della Società Zoologica Italiana*, ser. 3, **2**, 195–198. (Accepts the association of jaw and skull, but considers that a new species should not have been based on such incomplete material. From Miller 1915.)

Wade, N. 1978. Voice from the dead names new suspect for Piltdown hoax. *Science*, **202** (8 Dec), 1062. (Reaction to Halstead 1978a)

Wade, N. 1990. New light on an old fraud. *New York Times Book Review*, 11 Nov, 7.14. (Review of *Piltdown: a scientific forgery*, by F. Spencer, 1990. The reviewer does not support Spencer’s case against Keith.)

Wade, N. (see also under Broad, W.)

Walkhoff, O. 1913. Entstehung und Verlauf der phylogenetischen Umformung der menschlichen Kiefer seit dem Tertiär und ihre Bedeutung für die Pathologie der Zähne. *Deutsche Monatsschrift für Zahnheilkunde*, **31** (Dec), 947–979. (Discussion of Piltdown, pp. 972–978 & fig. 8. The writer accepts the association of skull and jaw, the latter of which confirms his views on the origin of the human chin. This paper drew a response from Adloff 1914.)

Walsh, J. E. 1996. *Unraveling Piltdown: the science fraud of the century and its solution*. New York & Toronto: Random House, 279 pp, 8 plates; republished in the UK as *Unravelling Piltdown* [etc.] by The Softback Preview, Bath, 1997. (Walsh is in no doubt that Dawson alone perpetrated the Piltdown fraud which, he contends, should not be labelled as either a joke or a hoax. Among the list of suspects discussed are William Butterfield, Lewis Abbott, William Sollas, Grafton Elliot Smith, Martin Hinton, Samuel Woodhead, John Hewitt and Frank Barlow, while separate chapters are devoted to Sir Arthur Conan Doyle, Teilhard de Chardin, and Sir Arthur Keith. Walsh (pp. 246–7) appears to have been the first to make use of an unpublished manuscript by Robert L. Downes (1956) which examines other potential forgeries by Dawson. Walsh’s treatment of Dawson is perhaps unduly harsh. For book reviews see for example Anon. 1996, Bernstein, 1996, Hammond, N. 1996; Turrill 2006, 17, lists several other reviews.)

Warren, S. H. 1905a. On the origin of eoliths. *Man*, **5**, 179–183; correction issued with reprinted version. (The writer has arrived at the same conclusions as Boule 1905 after having carried out a similar line of investigation into the origin of so-called eoliths, which, he concludes, ‘cannot in themselves be looked upon as giving any satisfactory evidence of the presence of man.’)

Warren, S. H. 1905b. On the origin of “Eolithic” flints by natural causes, especially by the foundering of drifts. *Journal of the Royal Anthropological Institute*, **35**, 337–364. (Not seen)

Warren, S. H. 1914. The experimental investigation of flint fracture and its application to problems of human implements. *Journal of the Royal Anthropological Institute*, **44**, 412–450. (Not seen)

Warren, S. H. (contribution to discussion in Dawson & Woodward 1914b: comments briefly on the bone implement, which seems to him to be a hacking tool rather than a club)

Washburn, S. L. 1953. The Piltdown hoax. *American Anthropologist*, **55**, 759–762. (Not seen)

Washburn, S. L. 1954. An old theory is supported by new evidence and new methods. *American Anthropologist*, **56**, 436–441. (Not seen)

Washburn, S. L. 1979. The Piltdown hoax: Piltdown 2. *Science*, **203** (9 Mar), 955–958. (The theory that Piltdown man was a joke, at least partially designed by W. J. Sollas (News and Comment, *Science*, 8 Dec 1978, p. 1062), does not fit the facts. The writer points out that the only person who can be associated with Piltdown 2 is Dawson. ‘Clearly, Piltdown 2 was no joke but an attempt to end the controversy which gravely affected the importance of Piltdown 1. Piltdown 2 had the desired effect and converted many scientists (e.g. Osborn 1922b), or reinforced the opinions of others (Hooton 1931). Washburn has no difficulty in crediting the amateur Dawson with the forgery, and outlines a different method by which someone with more anatomical knowledge would have treated the jaw and cranium in order to make the association more believable.)

Washburn, S. L. 1981a. Piltdown in letters. *Natural History*, **90**, (6), 12–16. (Defends Teilhard de Chardin against Gould’s accusation of complicity in the Piltdown affair)

Washburn, S. L. 1981b. William King Gregory, 1876–1970. *American Journal of Physical Anthropology*, **56** (4) Dec, 393–395.

Washburn, S. L. 1992 (contribution to discussion in Tobias 1992c: ‘While attending a Wenner-Gren Foundation conference in London in 1953, Kenneth Oakley arranged an exhibit of some British Museum fossils, including Piltdown. After looking over the originals at the exhibit, both J. S. Weiner and I concluded that they were fakes. In view of the long history of Piltdown, this was a major decision. After his return to Oxford, Weiner examined casts of Piltdown and described his thoughts to Clark and Oakley. I worked for only a few months after my return to Chicago (Spencer 1990a:214). That Weiner and I came to the same conclusion after so much controversy over so many years is surprising... My own brief efforts in Chicago convinced me that it was easy to make a Piltdown and that, in an odd way, the extreme protection which the British Museum had given Piltdown, in fact, protected the forgery.’ The writer thinks that ‘Dawson needed no helper and did not have one, thus eliminating all the suspects, including Keith.’)

Washburn, S. L. 1996. Dawson, not Doyle. *Pacific Discovery*, **49** (3), 48. (A response to Anderson 1996a–b)

Washburn, S. L. (see Lowenstein *et al.* 1982)

Waterston, D. 1912 (contribution to discussion in Dawson & Woodward 1912: ‘Prof. Waterston pointed out that, if the reconstruction of the cranium and mandible were accepted, it was quite clear that the former was human in practically all its essential characters; while the latter with equal clearness resembled, in all its details, the mandible of the chimpanzee. It was, therefore, very difficult to believe that the two specimens could have come from the same individual.’)

Waterston, D. 1913. The Piltdown mandible. *Nature*, **92** (13 Nov), 319. (Restates the view expressed by him in the discussion that followed the reading of Dawson & Woodward’s paper on 18 Dec 1912, that the Piltdown jaw demonstrates a striking similarity to that of a chimpanzee)

Waterston, D. 1923. The prehistoric find at Piltdown. *Proceedings of the Royal Physical Society of Edinburgh*, **20**, 211–216. (Not seen)

Watson, J. 1954. The Piltdown hoax. *New Statesman and Nation*, 27 Nov, 696–697. (Turrittin 2006 cites this as the first published account to implicate Conan Doyle)

Weidenreich, F. 1932 (see Friederichs 1932)

Weidenreich, F. 1936. The mandibles of *Sinanthropus pekinensis*: a comparative study. *Palaeontologia Sinica, Series D*, **7** (3), 132 pp, 15 plates. (The Piltdown mandible, pp. 117–119. Considers the Piltdown jaw and skull to be unrelated: ‘If the Piltdown mandible is to be considered as belonging to a human being ... this would imply that in England a hominid lived with the brain case of recent man and an ape-like mandible, while in the Far East (Choukoutien) at about the same time another human being lived with the most primitive brain case known hitherto, approaching that of chimpanzee and with a mandible distinctly closer related to that of recent man than to chimpanzee.’ Detailed comparison shows that ‘The Piltdown jaw resembles at the most a female orang and is no more similar to *Sinanthropus* than the female orang.’)

Weidenreich, F. 1937. The dentition of *Sinanthropus pekinensis*: a comparative odontography of the hominids. *Palaeontologia Sinica, New Series D*, no. 1, v, 180 pp + separate atlas of plates. (The Piltdown teeth, pp. 146–149, & figs 141, 147, 213, 216, 217, 317 & 342 in atlas [not seen]. The molars in the Piltdown jaw are considered to be comparable with those of a modern female orangutan, whereas the isolated molar from Piltdown II is thought to be more human. The Piltdown canine is quite unlike that of *Sinanthropus*, but

neither does it bear any resemblance to that of an orang and thus does not belong with the jaw. Also, the smooth, concave wear on this tooth does not fit the pattern of wear expected of a canine.)

Weidenreich, F. 1943. The skull of *Sinanthropus pekinensis*: a comparative study on a primitive hominid skull. *Palaeontologica Sinica, New Series D*, no. 10, whole series no. 127, xxi, 298 pp. (In the light of the discovery of *Sinanthropus* the author feels compelled to reject the authenticity of Piltdown Man. He supports the view, put forward by Frassetto in 1927 and Friederichs in 1932, that the Piltdown jaw belongs to an orangutan, p. 216.)

Weidenreich, F. (for an obituary see Howells 1981)

Weiner, J. S. 1952. Physical anthropology since 1935. In: *A hundred years of anthropology* / edited by T. K. Penniman. London: Gerald Duckworth & Co, 512 pp. (Including a review of the Piltdown conundrum)

Weiner, J. S. 1954a. [Remarks on the Piltdown molars and canine.] *Proceedings of the Geological Society of London*, no. 1504 (6 Jan), xvii–xviii. (Report of presentation made at a meeting on 25 Nov 1953. Weiner was evidently preceded at the meeting by A. T. Marston, and in opposition to Marston's conclusion that the Piltdown jaw and teeth are those of a fossil ape, went on to present evidence of artificial abrasion shown by the molars and canine. Marston's famous outburst, in which he criticised the experts for using Dawson as a scapegoat in order to cover up their own ineptitude, was widely reported in the press but went unremarked in the Society's *Proceedings*; see Anon. 1953d, 1953f, Turrill 2004. Oakley also made a presentation.)

Weiner, J. S. 1954b. [Comparison of the Piltdown molars and canine with those of a female orangutan experimentally ground and polished.] *Proceedings of the Geological Society of London*, no. 1514 (15 Sept), cxvi. (Report of a presentation made at a meeting on 2 June 1954 demonstrating the results of new investigative techniques applied to the Piltdown assemblage. See Beer 1954.)

Weiner, J. S. 1955a. Outline of the Piltdown problem. In: Further contributions to the solution of the Piltdown problem / J. S. Weiner *et al.* *Bulletin of the British Museum (Natural History), Geology*, **2** (6), 229–233. (Smith Woodward was able to put forward a coherent and convincing case for the integrity of *Eoanthropus dawsoni*, which Weiner resolves into a close-knit set of eleven arguments all tending to favour Woodward's interpretation. The absence of the chin (symphyseal region) and articulating condyle from the lower jaw was crucial in disguising its fully ape-like character; while the flat wear on the artificially abraded molar teeth was distinctly un-ape-like. By 1950 every possible opinion of Piltdown Man's status had been discussed. Once the hypothesis of a fake had been entertained it provided a compelling explanation of the circumstances of the finds and the sequence of discoveries. Weiner lists seven issues that were adequately explained by such a hypothesis, which were now fully confirmed by the latest series of scientific tests.)

Weiner, J. S. [Feb] 1955b. *The Piltdown forgery*. London: Oxford University Press, xii, 214 pp, [8] plates, correction slip; 2nd impression, corrected, Aug 1955; re-issued 2003 (50th anniversary edition) with a new introduction and afterword by Chris Stringer. Oxford: Oxford University Press, xix, 212 pp, [8] plates. (This remains one of the most readable examinations of the Piltdown affair, written by the man who initiated the scientific re-examination of the Piltdown assemblage in 1953 and undertook the first detailed investigation of the background to the forgery. Dawson appears as the principal suspect, but Weiner stops short of outright accusation. Francis Vere, a stout defender of Dawson, was at the same time racing to complete his counter-attack, entitled *The Piltdown fantasy*. Weiner admitted in a letter to Charles Blinderman (1986, 105) that 'he had written hastily, to scoop Vere.' For reviews see Anon. 1955d, Daniel 1955, Mather 1955; Easley 1956; a less than complimentary review appears in Edmunds 1955b; see comments by Squire 1955; for reference to other reviews and reactions see Turrill 2006, 16–17. See also comments under Stringer 2003.)

Weiner, J. S. 1956. *Felande länkens mysterium*. Published in Sweden by WoW. (A translation into Swedish of Weiner 1955b. The Swedish title translates as 'Missing link mystery'. Not seen)

Weiner, J. S. 1960. The evolutionary taxonomy of the Hominidae in the light of the Piltdown investigation. In: *Men and cultures: selected papers of the fifth International Congress of Anthropological and Ethnological Sciences, Philadelphia, September 1–9, 1956* / edited by A. F. C. Wallace. Philadelphia: University of Philadelphia Press, pp. 741–752. (Not seen)

Weiner, J. S. 1963. The Piltdown affair. In: *The world of the past* / edited by J. Hawkes. New York: A. A. Knopf, pp. 213–219. (Not seen)

Weiner, J. S. 1973a. Piltdown hoax. *New Scientist*, **57** (29 Mar), 750. (A response to John Hillaby's question as to whether Weiner thinks that Teilhard was implicated in the Piltdown forgery. Weiner replies: 'I know of no "hard" evidence which would incriminate Teilhard de Chardin as the "Mephistopheles" figure behind Dawson. My own views on Teilhard's role as unwitting accomplice, I hope to discuss in a new edition at greater length than was possible for me in the first edition of my book.' Weiner was never able to accomplish this, but see G. A. Harrison 1983.)

Weiner, J. S. 1973b. Grafton Elliot Smith and Piltdown. In: *The concepts of human evolution* / edited by S. Zuckerman. London: Academic Press/Zoological Society of London (Symposia of the Zoological Society of London, no. 33), pp. 23–26. (Attempts to disprove the case made by Millar 1972 accusing Elliot Smith of being the perpetrator of the Piltdown forgery. Millar's weakly argued case 'rests more on an attempt to exonerate Charles Dawson than on any positive evidence incriminating Elliot Smith.' Weiner provides further background to his original investigation into Dawson's affairs in Lewes. 'In conclusion I think it is worth asking whether there is any point to Mr Millar's book apart from the totally unconvincing attempt to incriminate Grafton Elliot Smith.')

Weiner, J. S. 1974. The Piltdown forgery. *The Times*, 27 Apr, 15. (Weiner dismisses Alfred Scheuer's 1974b criticism of 'established specialists', which is based on a distorted presentation of the Piltdown case. 'Concerning the revision of my 1955 book to which Professor Glyn Daniel (April 18) has alluded, and which will no doubt take some time to appear, I would say this much. My views on the authorship of the Piltdown forgery remain quite unchanged. I find it impossible to exonerate Charles Dawson.')

Weiner, J. S. 1979. Piltdown hoax: new light. *Nature*, **277** (4 Jan), 10. (Dismisses Halstead's presentation of Douglas's assertion that W. J. Sollas was involved in the 'hoax')

Weiner, J. S., Le Gros Clark, W. E., Oakley, K. P., Claringbull, G. F., Hey, M. H., Edmunds, F. H., Bowie, S. H. U., Davidson, C. F., Fryd, C. F. M., Baynes-Cope, A. D., Werner, A. E. A. & Plesters, R. J. 1955. Further contributions to the solution of the Piltdown problem. *Bulletin of the British Museum (Natural History), Geology*, **2**, (6), 227–287, plates 27–31. (A detailed account of the full extent of the scientific investigation into the Piltdown 'hoax'. Gavin de Beer, Director of the NHM, in an introduction, concludes that 'not one of the Piltdown finds genuinely came from Piltdown.' Published 21 Jan 1955. For further comments see under names of contributors. For a review see Spaulding 1955)

Weiner, J. S. & Oakley, K. P. 1954. The Piltdown fraud: available evidence reviewed. *American Journal of Physical Anthropology*, **12** (1), 1–8. (Based on 'The Solution of the Piltdown Problem' 1953, and on a discussion at the Geological Society of London, 25 Nov 1953)

Weiner, J. S., Oakley, K. P. & Le Gros Clark, W. E. [Nov] 1953. The solution of the Piltdown problem. *Bulletin of the British Museum (Natural History), Geology*, **2**, (3), 141–146, plates 8–9. (In order to test the proposition that the hominoid remains from Piltdown had been faked, a critical re-study of the material was undertaken with this specific possibility directly in view. Evidence was obtained of artificial abrasion of the teeth. An improved test of the fluorine content showed that whereas the cranium may well be Upper Pleistocene, the mandible, canine tooth and isolated molar are quite modern. The organic content supports this conclusion. The black coating of the canine appears to be a tough, flexible paint-like substance. The reddish-brown colour of the mandible and cranial bones is due to artificial staining with iron oxides, though in the case of the former the staining is quite superficial. The piece of frontal bone from Piltdown II appears to belong with Piltdown I, while the isolated molar from Piltdown II almost certainly belongs with the mandible from Piltdown I. For a denial of these findings see Marston 1954b. The results were widely reported in the newspapers: see comments under Anon. 1953a)

Weiner, J. S. (see also: Anon. 1954c, Emerson & Weiner 1955a–c, Harrison, G. A. 1983, 1990, King, T. M. 1983a; Oakley & Weiner 1953, 1955, Salzman 1955b; for obituaries see Anon. 1982, Daniel 1982b, Harrison & Collins 1982, Reynolds 1982)

Weinert, H. 1932. Der "Morgenröte-Mensch" von Piltdown – eine Untersuchung der Originalfossilien. *Forschungen und Fortschritte*, **8**, 449–450; also reported in *Science*, **77**, 1933, no. 1990, supplement, 6–7.

Weinert, H. 1933. Das Problem des "Eoanthropus" von Piltdown: eine Untersuchung der Originalfossilien. *Zeitschrift für Morphologie und Anthropologie*, **32**, 1–76, 7 plates; also *L'Anthropologie*, **44**, 1934, 349–352. (Blinderman 1986, 61, describes this as '76 pages comprising a perfect study in confusion. Separating the fossils into human skull and ape lower jaw would be a comfortable solution; but they belong together. How can one explain that simian lower jaw? By labeling it a throwback, that's how. Weinert brings up a more

sensible explanation of similarities between the cranial fragments of the two sites [Piltdown I and II]: those assumed to have come from Site II really came from Site I. Someone goofed in the inventorying.')

Weinert, H. 1951. Das Problem des *Eoanthropus* von 1951. In: *Stammesenwicklung der Menschheit*. Braunschweig: Vieweg. (Not seen)

Weinert, H. 1953. Der Fossile Mensch. In: *Anthropology today* / edited by A. L. Kroeber. Chicago: University of Chicago Press, pp. 101–119. (Believes that the Piltdown jaw, if properly reconstructed, will prove to be hominid and by no-means ape-like)

Weinert, H. 1954. Zur neuen angeblichen Lösung des Piltdown-Problems [sic.] *Zeitschrift für Morphologie und Anthropologie*, **46** (2), 304–315. (Not seen)

Weinert, H. 1958. Zum Abschluß des Piltdown-Problems. *Zeitschrift für Morphologie und Anthropologie*, **49** (1), 55–60. (Weinert was at first reluctant to accept the initial findings of the investigation into the Piltdown forgery, but acquiesced after the full report appeared in 1955. He had examined the original finds at the Natural History Museum in 1932, and at the time had suspected that the bones from Piltdown I and II may have become mixed up.)

Werner, A. E. A. & Plesters, R. J. 1955. The black coating on the Piltdown canine. In: Further contributions to the solution of the Piltdown problem / J. S. Weiner *et al.* *Bulletin of the British Museum (Natural History), Geology*, **2** (6), 271–272. (Chemical examination of the black material coating the Piltdown canine indicates that it is a paint consisting of natural bituminous pigment, such as Cassel Earth or Cologne Earth (Vandyke brown), which contains a fairly high proportion of iron oxide, rather than a pure iron oxide pigment mixed with bitumen.)

Werth, E. 1916. Die Auflösung des *Eoanthropus Dawsoni*. *Zeitschrift für Ethnologie*, **48**, 261–264. (Attributes the Piltdown finds to *Pan vetus* and *Homo dawsoni*)

Werth, E. 1919. Das Problem des tertiären Menschen. *Sitzungsberichte der Gesellschaft Naturforschender Freunde zu Berlin*, Jahrgang 1918, 1–32. (*Eoanthropus*, pp. 21–26)

Werth, E. 1928. *Der fossile Mensch: Grundzüge einer Paläanthropologie*. Berlin: Borntraeger, 898 pp. (*Eoanthropus*, pp. 803–808)

Whitaker, W. (see Moir 1912b)

White, H. J. O. 1926. *The geology of the country near Lewes*. London: HMSO, Memoirs of the Geological Survey, England, explanation of sheet 319, v, 97 pp, 4 plates. (Description of the Ouse valley terrace gravels at Piltdown and Barkham, pp. 63–70, with a geological cross section provided by F. H. Edmunds, fig. 10; the gravel terrace is here shown to be only 50ft above the present level of the River Ouse, not 80ft as previously claimed by Dawson. Includes remarks communicated by A. Smith Woodward in a letter dated 28 Oct 1924 concerning an undescribed 'thick and well-mineralized human skull of modern type' found by Dawson 'in the fields... just above Barcombe Mills Station' (i.e. Piltdown III), and quotes the same letter respecting the location of the second Piltdown site. The Barcombe site is thought by the Survey to correspond with a 'low bluff, called Crink Hill, close to Barcombe Mills Station. The Crink Hill gravel has been dug in shallow pits, now turfed over.' The Geological Survey took three photographs in 1925 during the course of its revision geological mapping of the Lewes area, none of which found their way into the published Memoir. These depict the gravel plateau at Barkham, a dug trench at Barkham, and the summit of Crink Hill: see Rhodes 1925 for details. See also Geological Survey of Great Britain for associated geological maps.)

Whittaker, J. 2005. Bits of bogus science preceding Piltdown. *Skeptical Inquirer*, **29** (1), 50–51. (Not seen)

Wilford, J. N. 1990. Mastermind of Piltdown hoax unmasked? *New York Times*, 5 June, A1, C6. (Early publicity about Frank Spencer's forthcoming book on the Piltdown forgery, in which he implicates Arthur Keith as the perpetrator, led to a spate of press coverage, of which the present account was possibly the first to publish a statement of the accusation (cited in Turritin 2006, 23). News appeared in London the following day: see Nuttall 1990.)

Williams, J. L. 1913. The origin and evolution of man: recent views suggested by the discovery of the Piltdown skull. *Scientific American*, 6 Dec. (Not seen)

Williams, J. L. (see also Anon. 1913f, Keith 1913d; for a biographical account see Clapp 1925. James Leon Williams, 1852–1932, was an American dental surgeon resident in London from 1887 who assisted Arthur Keith in preparing a modified reconstruction of the Piltdown jaw in 1913 (Spencer 1990b, 70, 77, 81). Williams made a (cinematic?) film of the excavations at Piltdown in 1913, now believed lost (Spencer 1990b, 73), from which a much-reproduced image has been preserved showing Woodward, Dawson and Venus Hargreaves screening gravel at Piltdown, reproduced Osborn 1922b. Williams abruptly returned to America in Nov 1913 and settled in New York, where he gave several lectures on Piltdown (Spencer 1990a, xxvi, 63, 64, 217 n. 26, 242 n. 62) and donated casts to the American Museum of Natural History (Osborn 1920). The suspicion (Spencer 1990a, 236 n. 69; 1990b, 102–103) that Williams was the source of the rumour reported by Gregory (1914) that the Piltdown remains were fraudulent, is based on surmise and is unsupported by the fact that Williams published an article on Piltdown in *Scientific American* and gave lectures on the subject, e.g. to the New York Academy of Sciences in Feb 1914, as reported in Spencer 1990b, 102.)

Wilson, A. 1956. *Anglo-Saxon attitudes*. London: Secker & Warburg, 412 pp. (A novel, in which the essential storyline was inspired by the exposure of the Piltdown forgery in 1953–55. Gerald Middleton, a retired professor of medieval history, has long suspected that one of the most important archaeological finds of the century, the Melpham Idol, a pagan phallic figure found in the coffin of a disinterred bishop, some 40 years earlier, in 1912, was a hoax committed by his best friend (with the possible connivance of others) who died in the trenches during the Great War. He has long kept his suspicions to himself until a new discovery thrusts the Melpham Idol back into the limelight, and he is forced to seek out the truth. Wilson also published, in 1981, a paper entitled ‘The genesis of Anglo-Saxon attitudes’ available at: <http://www.lib.uiowa.edu/spec-coll/bai/anglo.html> The novel was dramatised by Andrew Davies in three episodes for Thames Television in 1992 and has been issued on DVD.)

Wilson, J. T. 1938. Sir Grafton Elliot Smith, 1871–1937. *Obituary Notices of Fellows of the Royal Society*, 2, no. 6, 323–333, plate. (‘From the outset of his career he proved himself to be not only an observer of keen and penetrating vision but a master of clear and forcible expression. He became, indeed, a most vigorous controversialist who rather relished the joy of battle. One cannot but regret that at times his lucid thought was apt to express itself in a somewhat overforceful and pungent style, so that those to whom he was personally unknown could hardly be expected to discern the thoroughly genial and friendly personality concealed by the trenchant language of the acute and unsparing critic...’)

Winslow, J. H. & Meyer, A. 1983a. The perpetrator at Piltdown. *Science* 83, 4 (7) Sept, 32–43, editorial 5. (An absurd piece of sensationalism that accuses Sir Arthur Conan Doyle of perpetrating the Piltdown fraud. The evidence is circumstantial and trivial, and quite insufficient to support an argument that does little credit to either author. Reports of the claim featured in several newspapers in August, e.g. Anon. 1983, Paul 1983, and others listed in Turriffin 2006, 19. For reactions to this paper see Cox 1983, Gould 1983b, Moriarty 1983, Langham 1984, Doyle & Costello 1987, Elliott 1988; other responses are listed in Turriffin 2006, 19.)

Winslow, J. H. & Meyer, A. 1983b. Piltdown debate: not so elementary. *Science* 83, 4 (9) Nov, 23–24. (Reply to criticisms from Don Richard Cox and Stephen Jay Gould)

Winton, W. 1956. The Piltdown clock. *The British Steelmaker*, Oct, 292–293. (The Ashburnham brass clock dial, an engraved piece ‘apparently’ of the seventeenth century, had once been in the collection of Charles Dawson. While the clock plate appears to be of early 19th century date, the engraving could be late 19th or early 20th century. See Combridge 1977, Russell 2003, 144–148.)

Woodhead, S. A. (Samuel Allinson Woodhead, 1862–1943, was a chemistry instructor at Uckfield Agricultural College, and Public Analyst for East Sussex & Hove. A close friend of Charles Dawson, he analysed a fragment of the Piltdown cranium in November 1912. See Spencer 1990b, 32. For an obituary see Wright, R. F. 1943. He was first implicated as the Piltdown forger by Costello in 1985; see discussion in Turriffin 2006, 28. Farrant (2013, Appendix 2, 11) lists three papers published jointly with Dawson, 1899–1900, on the structure of beeswax and honeycomb.)

Woodward, A. S. 1892. On a mammalian tooth from the Wealden Formation at Hastings. *Proceedings of the Zoological Society of London*, for 1891, 24 (4), 585–586. (Received 17 Nov 1891; published 1 Apr 1892. Stated as having been discovered by Charles Dawson in an irregular bone-bed in the Wadhurst Clay. Woodward pronounced this molar tooth to be ‘the first evidence of a European Cretaceous Mammal’, and provisionally named it as a new species, *Plagiaulax dawsoni*. He notes the ‘extraordinary amount of wear to which the crown has been subjected’. Mammals belonging to the genus *Plagiaulax* had already been found in the ‘Purbeck Beds’, which in Woodward’s day were placed at the top of the Jurassic, but have since been reclassified as part of the Cretaceous.)

Woodward, A. S. 1898. *Outlines of vertebrate palaeontology for students of zoology*. Cambridge: University Press, xxiv, 470 pp. (Devotes three pages to the Hominidæ: 'Of the immediate ancestors of man...scarcely anything is known from the discovery of fossil bones... The oldest known traces of a man-like skeleton seem to be an imperfect roof of a skull, two molar teeth, and a diseased femur, from a bed of volcanic ash containing the remains of Pliocene mammals, near Trinil, in central Java [Dubois 1894]... The oldest human skeletons of which the geological age is determined with certainty, are two from the cavern of Spy, near Namur, in Belgium. These were found in association with the remains of the mammoth and other Pleistocene mammals ... They are essentially human in every respect, but seem to represent a race inferior in skeletal characters to any now existing. They are small, but powerfully built... This type is now generally known as the *Neanderthal race*; the roof of a similar skull having been found associated with other fragmentary remains so long ago as 1857, in a cavern in the Neanderthal between Düsseldorf and Elberfeld, Germany. So far as can be determined from implements, man appears to have passed through three successive grades of civilization in western Europe before Britain became separated from the mainland. The earliest stones regarded as bearing traces of human handiwork, occur in certain high-level or plateau gravels in the south of England, which seem to date back to the Pliocene period before the existing valleys were excavated. These are flints merely chipped round the edge to render them more serviceable as implements. They are described as *eoliths*...')

Woodward, A. S. 1911. On some mammalian teeth from the Wealden of Hastings. *Quarterly Journal of the Geological Society, London*, **67** (2), 278–281 (with discuss). (Read 22 Mar 1911. Notes that Charles Dawson has made a determined search for further mammalian teeth in the Wealden formation of Sussex, recently assisted by P. Teilhard de Chardin and Félix Pelletier. Three further mammalian teeth have been recovered from the Ashdown Sands of the Fairlight Cliffs near Hastings. Two of these teeth, which were evidently found by Dawson, seem to belong to *Plagiaulax* but are very imperfect and are not illustrated. The specimens have been lodged with the Natural History Museum. The discussion which followed the reading of this paper includes remarks from Dawson, W. Boyd Dawkins and Henry Woodward. With regard to these teeth, see Clemens 1963.)

Woodward, A. S. 1913. Note on the Piltdown man (*Eoanthropus Dawsoni*). *Geological Magazine*, dec. 5, **10** (10), 433–434, plate XV. (Abridged from a lecture delivered to the British Association at Birmingham on 16 Sept 1913, but here with the addition of a reconstruction of the skull and mandible. See Woodward 1914a)

Woodward, A. S. 1914a. Missing links among extinct animals. *Report of the British Association for the Advancement of Science*, Birmingham, 1913, 783–787. (Lecture delivered 16 Sept 1913, including a reply to Prof Arthur Keith's disapproval of his reconstruction of the skull and mandible of *Eoanthropus dawsoni*, and a report on the discovery by Father Teilhard of a canine tooth at Piltdown on 30 Aug, pp. 785–787. The lecture was reported in *The Times*, 17 Sept 1913, p.10, headed 'The Piltdown skull: Dr. Smith Woodward's rejoinder', and briefly reported in *Nature*, 1913, **92** (25 Sept), 110–111, headed 'The Piltdown skull'.)

Woodward, A. S. 1914b. On an apparently Palaeolithic engraving on bone from Sherborne (Dorset). *Quarterly Journal of the Geological Society of London*, **70** (1), 100–103 (with discuss). (Supposedly discovered by two boys of Sherborne School, but now believed to be a fake. Poor Woodward was once again duped, though he was not alone, as appears from the discussion. See Stringer *et al.* 1995. Ironically, this paper immediately follows the second Piltdown paper by Dawson & Woodward. See also Woodward 1926.)

Woodward, A. S. 1914c. On the lower jaw of an anthropoid ape (*Dryopithecus*) from the Upper Miocene of Lérida (Spain). *Quarterly Journal of the Geological Society of London*, **70** (3), 316–320, plate XLIV. (Read 29 Apr 1914. Comparisons are made with the jaw of *Eoanthropus*. He notes that the mandibular symphyses of *Mesopithecus* (a contemporaneous macaque), *Dryopithecus* and *Homo heidelbergensis* form a gradational series in which there appears to be no place for a stage resembling that of any adult existing ape. Yet it is difficult to understand how *Eoanthropus* can be one of the series. 'If the outlines of *Eoanthropus* and *Homo heidelbergensis* be superposed...it will be observed that the former differs from the latter in the specialization of the lower border towards that of a modern Ape.')

Woodward, A. S. 1915a. *A guide to the fossil remains of man in the Department of Geology and Palaeontology in the British Museum (Natural History)*. London: Trustees of the British Museum, [6], 30 pp, 4 plates. (Piltdown man, pp. 8–23, plates I–IV. See review by Smith, G. E. 1915a).

Woodward, A. S. 1915b. *The Antiquity of Man*, by Prof. A. Keith [review]. *Nature*, **96** (23 Dec), 450–451. (Woodward is critical of Keith's unquestioning acceptance of a Palaeolithic age for the Galley Hill (Kent) and Ipswich skeletons. In his view, Keith 'proceeds to forfeit confidence in his conclusions by the dogmatic manner in which he accepts remains of doubtful authenticity... No geologist would do more than place such

remains in a “suspense account,” and the majority would probably ignore them altogether.’ In Keith’s extended and rather discursive analysis of the skull and mandible of Piltdown man, Woodward feels that the experience of a vertebrate palaeontologist is needed to supplement and modify the ordinary methods of the human anatomist. There are some comments on Keith’s restoration of the Piltdown skull.)

Woodward, A. S. 1916. Obituary: Charles Dawson, F.S.A., F.G.S. *Geological Magazine*, dec. 6, **3** (10), 477–479. (Charles Dawson was born at Fulkeith Hall, Lancashire, 11 July 1864, and died 10 Aug 1916. ‘He had a restless mind, ever alert to note anything unusual; and he was never satisfied until he had exhausted all means to solve and understand any problem which presented itself. He was a delightful colleague in scientific research, always cheerful, hopeful, and overflowing with enthusiasm.’ As a Fellow of the Geological Society a short obituary dutifully appeared in the Society’s Proceedings for 1916–17 (*Quarterly Journal of the Geological Society of London*, **73** (1), Apr 1918, p. lxvi), but gives very little information. Short obituaries appeared in *The Times*, 11 Aug, p. 3, headed ‘Discoverer of the Piltdown skull’, and *Nature*, **97**, 17 Aug, p. 503; a longer obituary appeared in *Hastings & East Sussex Naturalist*, **2** (6), June 1917, 251–3, but is in large part a reprint of Woodward’s account.)

Woodward, A. S. 1917a. Early man. *Geological Magazine*, dec. 6, **4** (1), 1–4. (A critique of Henry Fairfield Osborn’s *Men of the Old Stone Age*, 1915, 2nd edition 1916, and Hugo Obermaier’s *El Hombre Fósil*, 1916. Woodward takes issue with Osborn’s interpretation of *Eoanthropus*. He expects soon to announce a discovery made by Dawson shortly before his death, confirming the interpretation that he and Dawson published in 1912 (Woodward 1917b). He admits that the associated mammalian fauna, some of which derives from an older stratum, does not permit *Eoanthropus* to be dated with exactness. In 1913 he was able to visit Eugene Dubois in Holland in order to examine all the original specimens of *Pithecanthropus erectus* from Java, and was impressed by its resemblance to a gibbon, a view then being entertained by its finder. Osborn considers *Pithecanthropus* to be a lowly type of man, whereas Obermaier treats it as a gigantic ape. Likewise, in 1912 Woodward went to Heidelberg in order to examine the lower jaw of *Homo heidelbergensis* and the associated mammalian remains. ‘As all palaeontologists agree, this mammalian fauna must date back to a very early part of the Pleistocene period.’ In 1914 a well-fossilised human skull was found in a river deposit at Talgai in the Darling Downs, Queensland. ‘Although in nearly every respect the skull of a typical Australian aborigine, this fossil agrees with *Eoanthropus* from Piltdown in having the relatively large canine teeth interlocking as in the apes, and it is the only known skull of *Homo* exhibiting this arrangement.’)

Woodward, A. S. 1917b. Fourth note on the Piltdown gravel, with evidence of a second skull of *Eoanthropus dawsoni*. *Abstracts of the Proceedings of the Geological Society of London*, no. 1003 (9 Mar), 50–53. (Abstract of paper and full record of discussion, with contributions from W. P. Pycraft, Prof. A. Keith, Sir Ray Lankester and W. Dale; includes details of specimens exhibited. See Woodward 1918 for full text of paper and reprint of discussion.)

Woodward, A. S. 1918a. Fourth note on the Piltdown gravel, with evidence of a second skull of *Eoanthropus dawsoni*. *Quarterly Journal of the Geological Society of London*, for 1917, **73** (1) 1–10 (with discuss), plate I (folded). (Read 28 Feb, 1917. Further extensive excavations at Piltdown during the summer of 1916 failed to yield anything of interest beyond a battered nodule of black flint, here supposed to be a hammer-stone. During the winter of 1914–15, Dawson had searched a large field about 2 miles from the Piltdown pit and had succeeded in finding two well-fossilised pieces of human skull and a molar tooth belonging to a second individual of *Eoanthropus dawsoni*. An appendix is included by G. Elliot Smith ‘On the form of the frontal pole of an endocranial cast of *Eoanthropus dawsoni*’, pp. 7–8. In the discussion which followed the reading of this paper, W. P. Pycraft exhibited the right half of a chimpanzee mandible sent to him by Gerrit S. Miller, in which the molars were worn flat like those of the Piltdown jaw, but Pycraft regarded this as an abnormality. Sir Ray Lankester suggested the possibility, ‘although highly improbable’, that the new molar and piece of frontal bone could belong to the first Piltdown find, though not the occipital fragment, which was already present in the latter. Little did he realise how prophetic this suggestion would prove to be!)

Woodward, A. S. 1918b. *A guide to the fossil remains of man in the Department of Geology and Palaeontology in the British Museum (Natural History)*. 2nd ed. London: Trustees of the British Museum, 32 pp, 4 plates.

Woodward, A. S. 1919. The Antiquity of Man. *Nature*, **104**, 212–213, 335. (Discussion of *Eoanthropus* and *Pithecanthropus*)

Woodward, A. S. 1921. A new cave man from Rhodesia, South Africa. *Nature*, **108** (17 Nov), 371–372. (A skull was discovered at the Broken Hill Mine, modern Kabwe, in what is now Zambia, in June 1921. It was presented to the London Natural History Museum that same year (Anon. 1921) and formally named

Homo rhodesiensis by Woodward, who recognised its resemblance to the European Neanderthal man, but thought it sufficiently distinct and more modern to warrant being placed in a new species. In 1928, after Woodward's retirement, W. P. Pycraft somewhat bizarrely (but influenced by the work of Boule) placed the Rhodesian man into a new genus, *Cyphanthropus*, or 'stooping man', a concept which gained little support since it was shown by Le Gros Clark that same year to derive from an error of interpretation and was thus returned to the genus *Homo*. The current specific status of Rhodesian Man is a little unclear. See also Harris, Woodward & Keith 1921)

Woodward, A. S. 1922. *A guide to the fossil remains of Man in the Department of Geology and Palaeontology in the British Museum (Natural History)*. 3rd ed. London: Trustees of the British Museum, 34 pp, 6 plates. (Piltdown man, pp. 8–25, plates I–IV)

Woodward, A. S. 1923. The first man on earth. *Weekly Dispatch*, 4 Mar. (Not seen)

Woodward, A. S. 1925. The fossil anthropoid ape from Taungs. *Nature*, **115** (14 Feb), 235–236. (Reaction to the announcement by Dart 1925 of his discovery of *Australopithecus*)

Woodward, A. S. 1926. The Palaeolithic drawing of a horse from Sherborne, Dorset. *Nature*, **117** (16 Jan), 86. (Expresses surprise at W. J. Sollas's claim in the 3rd edition of his *Ancient Hunters*, p. 536, that the drawing of the head of a horse on bone from Sherborne, which Woodward described in 1914, is a forgery perpetrated by some schoolboys. Woodward quotes confirmation from one of the surviving finders as to its genuineness. See reply by Sollas 1926)

Woodward, A. S. 1931. Sir William Boyd Dawkins—1837–1929. *Proceedings of the Royal Society, Series B*, **107**, no. B 754, xxiii–xxvi, plate.

Woodward, A. S. 1933a. The second Piltdown skull. *Nature*, **131** (18 Feb), 242. (Letter drawing attention to the existence of a postcard from Charles Dawson, dated 30 July 1915, recording his discovery of a molar tooth of *Eoanthropus* at an unnamed site, believed to be Sheffield Park. The letter follows doubts expressed by Dr Aleš Hrdlička in 1930. The postcard was deposited with the Natural History Museum and is reproduced as a frontispiece in Spencer 1990b.)

Woodward, A. S. 1933b. Early man and the associated faunas of the Old World. *Science*, **78**, 89–92. (Piltdown man, pp. 89–91. Cited in Quenstedt 1936)

Woodward, A. S. 1934. What the dawn-man was like. *Wonders of the Past*, no. 21, 22 Mar, 490–493. (A popular article, with illustrations by A. Forestier. A drawing showing the probable appearance of *Eoanthropus* in profile differs significantly from a similar profile that featured in the *Illustrated London News* of Dec 1912, which accompanied an article by W. P. Pycraft. Woodward here still regards the Piltdown dawn-man as the earliest ancestor of modern man. There is much speculation on his likely habits and abilities.)

Woodward, A. S. 1935. Recent progress in the study of early man. *Report, British Association for the Advancement of Science*, Norwich, Sept 1935, 129–142. ('The Pleistocene mammals of Europe...show that when they flourished on this continent, the only direct land communication was through Asia. The earliest races of men must have reached western Europe by that route; and as a succession of stone implements, remarkably similar to that which is now so well known in Europe, has already been found with early Pleistocene faunas in Africa, it might at first be supposed that there were parallel migrations of the same men from the Asiatic to the African continent. Implements like languages, however, afford no certain clue to the races which made and used them, and the same tools must have been invented independently more than once.' Leakey's claim to have found modern types of human with very primitive implements in Kenya has been proved false by P. G. H. Boswell. 'The only fossil hitherto discovered in Africa, which suggests that that continent may have produced man, is the immature skull from a deposit of uncertain age (probably Pleistocene) at Taungs in Bechuanaland, which was named *Australopithecus* by Prof. Raymond A. Dart in 1925. It belongs to an ape, and seems to exhibit more human characters than the skull of any of the existing apes.' After alluding to new discoveries in China, he goes on to discuss the position of *Eoanthropus*, the geological age of which 'is perhaps the most difficult to determine, because it was found in a flood-deposit which contains mammalian remains and flint implements of more than one stage at the end of the Pliocene and beginning of the Pleistocene periods. Attempts have been made to sort the fossils according to their colour; but the varied staining has no special significance... The colour of the first pieces of the skull of *Eoanthropus* itself, indeed, were altered by Dawson, who dipped them in bichromate of potash with the intention of hardening them.' He goes on to discuss the ages of the associated mammalian fauna at Piltdown. He believes there cannot be much difference in age between Piltdown and Heidelberg man; and likewise '*Sinanthropus*

dates back to the early part of the Pleistocene period and must have been a contemporary of *Eoanthropus*. Finds from Australasia, North and South America are also discussed.)

Woodward, A. S. 1938. The Piltdown bone implement. *Nature*, **141** (11 June), 1059. (Further to the letter by Moir 1938 in response to Breuil's conclusion that the cut marks on the Piltdown implement are the result of gnawing by a rodent mammal, and not by man, Woodward draws attention to the fossil skull of an extinct panda which provides a fine example of gnawing by rodents and is exhibited in the Natural History Museum, not far from the Piltdown implement. 'It is therefore easy to compare the work of rodents with that ascribed to man.')

Woodward, A. S. 1942. Obituaries: Mr. W. P. Pycraft. *Nature*, **149** (23 May), 575.

Woodward, A. S. 1944. The geographical distribution of ancestral man. *Geological Magazine*, **81** (2), 49–57. ('The latest studies of fossil Mammals appear to show that the Upper Pliocene and Pleistocene mammalian faunas of Europe were chiefly immigrants from the Asiatic region... So far as the facts are known, they favour the idea that central Asia north of the Himalayan Range is the area where Man most likely evolved.' Woodward goes on to discuss the work of Dr. W. D. Matthew (1915, revised 1939) who put forward the view that evolutionary centres must have been surrounded by rings of successive forms which had come into being, the earliest pushed to the outermost limit, the latest nearest the centre. 'Each of these forms would presumably survive longest at the outer limit of its range, where it avoided later competitors.' Woodward does not consider *Australopithecus* or other southern African human-like apes as ancestral to modern man. 'Equally remote from the presumed Asiatic centre is the fossil skull from Piltdown, Sussex. Like the ground-apes of South Africa, this still remains an isolated discovery.' He thinks it resembles the Chinese *Sinanthropus*, and in some respects Neanderthal man, but yet is unique. 'The relationship of Piltdown man to the other early human races is indeed still uncertain... The Piltdown skull therefore may perhaps indicate that before the type of modern man became fixed there was more than one approach to it among the evolving ape-ancestors.')

Woodward, A. S. 1948. *The earliest Englishman*. London: Watts & Co, 118 pp, 3 plates. (With a foreword by Sir Arthur Keith. The work was brought to publication by Maud Woodward, the author's wife, following his death in 1944. It appears that Woodward had begun the writing of this work and had completed the first chapter before the end of 1915, but other commitments eventually compelled him to set it aside. The present work was dictated to his wife during his blindness. A prefatory note by Maud Woodward records that 'the last word was written the day before he died.' The content is organised along the following lines: I. The story of the discovery; II. The Piltdown gravel and its flints; III. The fossils of the Piltdown gravel; IV. The tools of the Piltdown gravel; V. The everyday life of Piltdown Man; VI. The anatomical details of Piltdown Man; VII. The animals living with Piltdown Man; VIII. The evolution of man in the context of the Piltdown finds.)

Woodward, A. S. & Watts, W. W. 1938. William Johnson Sollas, 1849–1936. *Obituary Notices of Fellows of the Royal Society*, **2**, no. 6, 265–281, plate. ('Sollas was a man of wide and varied interests. A good linguist, remarkably well read both in his own subject and in general literature, he delighted in discussion and controversy, in which his pleasant and occasionally sarcastic humour, his command of information, and the often unexpected turn of his attack, rendered him a doughty antagonist... Although, like other men of genius and ideas, he was somewhat impatient of routine work and of research which did not promise an adequate return of theory or principle, he was nevertheless unsparing in his demand for accuracy, and untiring in extracting, by experiment, observation, and hypothesis, the maximum yield from his facts...')

Woodward, A. S. (see also Anon. 1924, Dawson, C, Given 1914, Harris, W. E, White 1926; for biographical notices and obituaries see: Anon. 1935, Anon. 1944, Brook 2014, Cooper, C. F. 1945, Woodward, H. 1915; also personal remarks by Keith 1950; the Natural History Museum has an unpublished manuscript autobiography that was utilised by Walsh 1996. Apart from the odd speculation (Dorren Ditch in Anon. 1955b), and an unpublished accusation by J. C. Trevor at Cambridge University (Spencer 1990a, 232, n. 78, records a rough draft of a communication intended for publication in *Nature*, dated 13 Feb 1967), Woodward had never seriously been considered a suspect in the Piltdown fraud until he was accused in 1994 by Gerell M. Drawhorn, who argued that Woodward's driving ambition to become Director of the Natural History Museum, an aspiration that was not fulfilled, led him to concoct Piltdown man in partnership with Dawson; see brief discussion in Turrill 2006, 28–29. Concerning Woodward's ambition see Spencer 1990a, 157 & 232, n. 81, and letter by G. G. Simpson in Gardiner 1987.)

Woodward, H. 1915. Eminent geologists: Arthur Smith Woodward. *Geological Magazine*, **6** (2), 1–5.

Woodward, M. (Lady Maud Smith Woodward, 1874–1963, frequently accompanied her husband during the excavations at Piltdown and can be seen in a photograph by her daughter, Margaret, reproduced in Walsh 1996. She was responsible for the posthumous publication of A. S. Woodward's *The Earliest Englishman* in 1948, and she was interviewed in 1954 by members of the investigative team following the discovery of fraud (Spencer 1990b, 233–4, 238–9). She was present when the nasal and turbinal bones were found (*ibid*, 233), and she had a slightly fuller story of how Teilhard de Chardin found the canine: 'Dawson threw a pebble on to a heap of spread material and suggested that T. de C. should sit there and look things over' (*ibid*, 234); as regards the Piltdown II site 'she was firm that D[awson] would not give details of the exact spot, that her husband was most anxious about it, and that D's illness made his enquiries fruitless, and that he spent much time searching for site II... It seemed to her that her husband regarded site II as something that D. had imagined, it "existed in Dawson's imagination." She knew that D. was rather queer in his last illness...' (*ibid*, 239). See also remarks attributed to her by V. Garner-Howe 1997a)

Worssam, B. C. 1973. A new look at river capture and at the denudation history of the Weald. *Report, Institute of Geological Sciences*, 73/17, vi, 21 pp. (While it is generally believed that the deposition of river terraces is related to changes in the base level of the drainage system, causing alternate aggradation and downcutting, the author here proposes that some river terraces were subject to the controlling influence of climate rather than of sea level. This theory would account for the broadly contemporaneous terraces in separate basins having different ranges of altitude.)

Wright, R. F. 1943. Samuel Allinson Woodhead [obituary]. *The Analyst*, **68**, 297.

Wright, R. V. S. 1992 (contribution to discussion in Tobias 1992c: the writer contends 'that Spencer and Tobias have misinterpreted Keith's reference to his visit to Piltdown. Keith does not write in his diary that he failed to visit the site or pit. What he writes is that he did not see "the gravel bed." Because the pit was under water when he visited it, it is not surprising that he did not see the lower levels, where the gravel bed was to be found. To reinterpret the two diary entries [the other concerning his writing of the *British Medical Journal* account of the Piltdown meeting before he went to it, for which there is adequate explanation] is to remove the original grounds for suspecting Keith, and we are left with the corroborative evidence. Onlookers at the trial (Spencer's simile, not mine) will surely feel uncomfortable if the prosecution has to abandon its original case yet still asks to present corroborative evidence. If I were the counsel for the defence I would argue that the trial should be aborted and invite Keith to seek substantial damages for wrongful prosecution.')

Wright, S. 2000. Charles Dawson 1864–1916. *Hindsight: Journal of the Uckfield and District Preservation Society*, **6**, 4–18. (This article derives in large part from Weiner 1955, Downes 1956, Walsh 1996, and a Mr Norman Edwards, resident of Uckfield. It is not free of error. An important piece of new information, said to originate from John Frisby, the Uckfield photographer, runs as follows: Mr. Frisby told George Bingham Towner, also a photographer (whose grand-daughter supplied this information), that 'the fraud by Dawson started out as a joke to see whether he could fool the experts. It backfired as it was taken seriously and after all the hoocha he found he could not retract and admit the hoax.' John Frisby also claimed that he had provided Dawson with the chemicals. Meanwhile John Frisby's son, Frank Simmonds Frisby, was doing a roaring trade by taking photographs of the 'dig' which he then turned into postcards to be sold at 'The Lamb', later the 'Piltdown Man'. Compiler's note (DGB): in 2011 the pub reverted to its earlier name after coming under new ownership. The distinctive pub sign (the last of several variant designs over the years) and all the framed Frisby photographs were thrown into the skip by the previous publican, as I was informed when I visited the place in Dec 2011.)

Wright, W. 1916a. [Review of *The Antiquity of Man*, by A. Keith, 1915]. *Man*, **16** (Aug), 124–127. (The reviewer is not convinced by Keith's arguments in support of an association between the skull and jaw of *Eoanthropus*, particularly given that his reconstruction of the skull shows it to fall within the range of human variation, whereas the jaw is clearly ape-like. He briefly alludes to J. Symington's criticism of Elliott Smith's interpretation of the endocranial cast, which prompted a response from Smith 1916c, and a reply from Wright 1916b. William Wright was Dean of London Hospital Medical College.)

Wright, W. 1916b. The endocranial cast of the Piltdown skull. *Man*, **16** (Oct), 158. (In response to Smith 1916c, who accuses the present writer, in Wright 1916a, of inaccuracy in respect of Symington's supposed criticism of Smith's method of reconstructing the Piltdown skull, he replies that 'It is quite true that Professor Symington has not discussed the mode of reconstruction of the skull, nor was it stated that he had, but he has criticised the mode of reconstructing the brain by taking a cast of the interior of the cranium... Professor Symington has further shown that even when an endocranial cast is taken under the most favourable conditions, such a cast can only convey a general idea of the external appearance of the brain', the more so when 'the cranium is fragmentary, and its reconstruction admittedly faulty...')

Young, S. A. 2001. Edward T. Hall. *Nature*, **413** (11 Oct), 592–593. (Professor ‘Teddy’ Hall, 1924–2001, was a scientist who worked with developing new methods to locate, date and authenticate ancient objects. He applied X-ray fluorescence spectroscopy to the Piltdown remains in 1953. An obituary also appeared in the *Daily Telegraph*, 17 Aug, p. 27.)

Zarris, V. 2009. Fake – review. *Chicago Stage Review*, 14 Oct: <http://www.chicagostagereview.com/fake/> (‘Steppenwolf Theatre creates an extravagant gothic setting for their world premiere of playwright Eric Simonson’s *Fake*. It tells the story of the controversy surrounding the 1912 discovery of the infamous “Piltdown Man” skull, purported to be the missing link between ape and man but later proved to be an elaborate hoax. Famous writer Sir Arthur Conan Doyle invites the finders of the skull and an American journalist to his home for an evening of witty banter regarding the find. When accusations of a prank arise, egos get bruised and the stage is set for a non-linear time-traveling who-done-it melodrama.’)

Ziman, J. M. 1970. Some pathologies of the scientific life. *Nature*, **227** (5 Sept), 996–997. (‘Scientists are in tacit cooperation when they communicate their results to one another, criticize, recognize, refer to, appoint or promote each other. They act in expectation that their contemporaries will behave according to certain conventions. Any serious breach of these conventions is a pathological symptom, deserving our attention... Strangely enough, deliberate, conscious, fraud is extremely rare in the world of academic science... the only well-known case is “Piltdown Man”, which is more of a monument to the absolute trust that we have in a reputable fellow scientist than an example of a grandly conceived crime... Self-deception... is an exceedingly common phenomenon in the scientific world.’)

Zuckerman, H. 1977. Deviant behaviour and social control in science. In: *Deviance and social change* / edited by E. Sagarin. Beverly Hills: Sage, pp. 87–138. (Reference to Piltdown occurs on pp. 92, 100–101. From Turriffin 2006.)

Zuckerman, S. 1971. Art and science in anatomical diagnosis. In: *Beyond the ivory tower: the frontiers of public and private science* / by S. Zuckerman. New York: Taplinger, pp. 61–74. (Originally from a 1954 essay. Speaking of the Piltdown fiasco, Zuckerman rather naively says: ‘Accepting that the jawbone was deliberately planted and faked, the faker must have known more about primate anatomy than all the highly distinguished anatomists he deluded. He knew enough to take them in not once but repeatedly.’ Not seen.)

Zuckerman, S. 1972. The Piltdown men. *Times Literary Supplement*, 27 Oct, 1287. (A response to Anon. 1972b. Zuckerman is sharply critical of Ronald Millar’s assertions against Elliott Smith. Not seen)

Zuckerman, S. 1973. Sir Grafton Elliot Smith. In: *The concepts of human evolution* / edited by S. Zuckerman. London: Academic Press/Zoological Society of London (Symposia of the Zoological Society of London, no. 33), pp. 3–21. (Defends Elliot Smith against the accusations of Millar 1972. Not seen)

Zuckerman, S. 1990a. A new clue to the real Piltdown forger? *New Scientist*, **128** (3 Nov), 16. (Refutes the claim by Frank Spencer (as stated in Shipman 1990) that Sir Arthur Keith was the hoaxer, and instead, points to Harrison Matthews’ contention that Martin Hinton, either alone or with some other person, was involved. Hinton’s entry in *Who’s Who* in 1935 records that he was interested in hoaxes and had studied many of them. The article reproduces Hinton’s posthumous entry in *Who Was Who* 1961–1970. See comment from Estling 1990.)

Zuckerman, S. 1990b. A phony ancestor: [review of Spencer 1990a]. *New York Review of Books*, **37**, no. 17, 8 Nov, 12–16. (See reply by Spencer 1991a, and response from Zuckerman 1991. Cited in Turriffin 2006)

Zuckerman, S. 1991. The Piltdown mystery: an exchange. *New York Review of Books*, **38**, no. 1/2, 17 Jan 1991, 58–59. (Reply to Spencer 1991a. Cited in Turriffin 2006)

Addenda

Elliott, D. 2012. *The link*. Loquat Valley Books, 328 pp, available in Kindle edition only. (A novel, in which the protagonist, a former voluntary worker with Martin Hinton at the Natural History Museum, on the day following the announcement of the facts of the Piltdown forgery (reported in *The Times*, 21 Nov 1953), recounts his own personal knowledge of the events beginning in November 1912. In his Prologue he states that 'Dawson's name is the one that comes up most often, of course, but there are others hovering in the shadows, too. I read the piece in the *Times* over and over yesterday and spent a sleepless night debating with myself whether I should tell my story. They're all dead now so you might argue – and I did – what does it matter? Yet it does: reputations still hang in the balance... Before yesterday it made no sense to speak out. Nobody would have believed me, a lone voice claiming that the great English discovery was a complete fraud. Even fewer would have believed that I brushed shoulders with the original discovery back in 1912 and that I knew it was a fraud even then... I will explain how I was first drawn into the affair, what Augustus Parker and I discovered in Sussex in November 1912, how lives were changed and lost, and how I learned that there are worse crimes than fraud.' Doug Elliott (see further entries in main part of Bibliography) has described the background to the novel in his online blog 'Five lesson from Piltdown Man'.)

Sabbagh, K. 1999. *A rum affair*. London: Allen Lane, ix, 224 pp. (Front dust jacket subtitled *how botany's 'Piltdown Man' was unmasked*. Published in the USA as *A rum affair: a true story of botanical fraud*. Professor John Heslop Harrison of Newcastle University was one of the most respected and knowledgeable botanists of the first half of the 20th century. His greatest passion was for plants of the Hebridean islands. He came to believe that some of the islands' plants were survivors from before the last Ice Age. In support of his theory, which was highly controversial, he began to report sightings of plants that had never previously been recorded on the islands. Botanists became suspicious. Were the plants really where Heslop Harrison claimed they were? Or had the wily old professor carried the specimens to the Hebrides from their sites of origin and planted them? Some of his most extraordinary discoveries were made on the island of Rum. Karl Sabbagh examines the thoughts, actions and motivation of Harrison and his academic enemies, and goes on to explore how some scientists are driven to the belief that fakery can be in the interest of science. From editorial review)



Imaginary portrait of Piltdown Man, drawn by John Cooke for Arthur Smith Woodward, *The Earliest Englishman*, 1948, frontispiece. We are told that 'Mr. Dawson...on seeing this portrait, smiled and observed that he thought he could match it in Sussex to-day.'